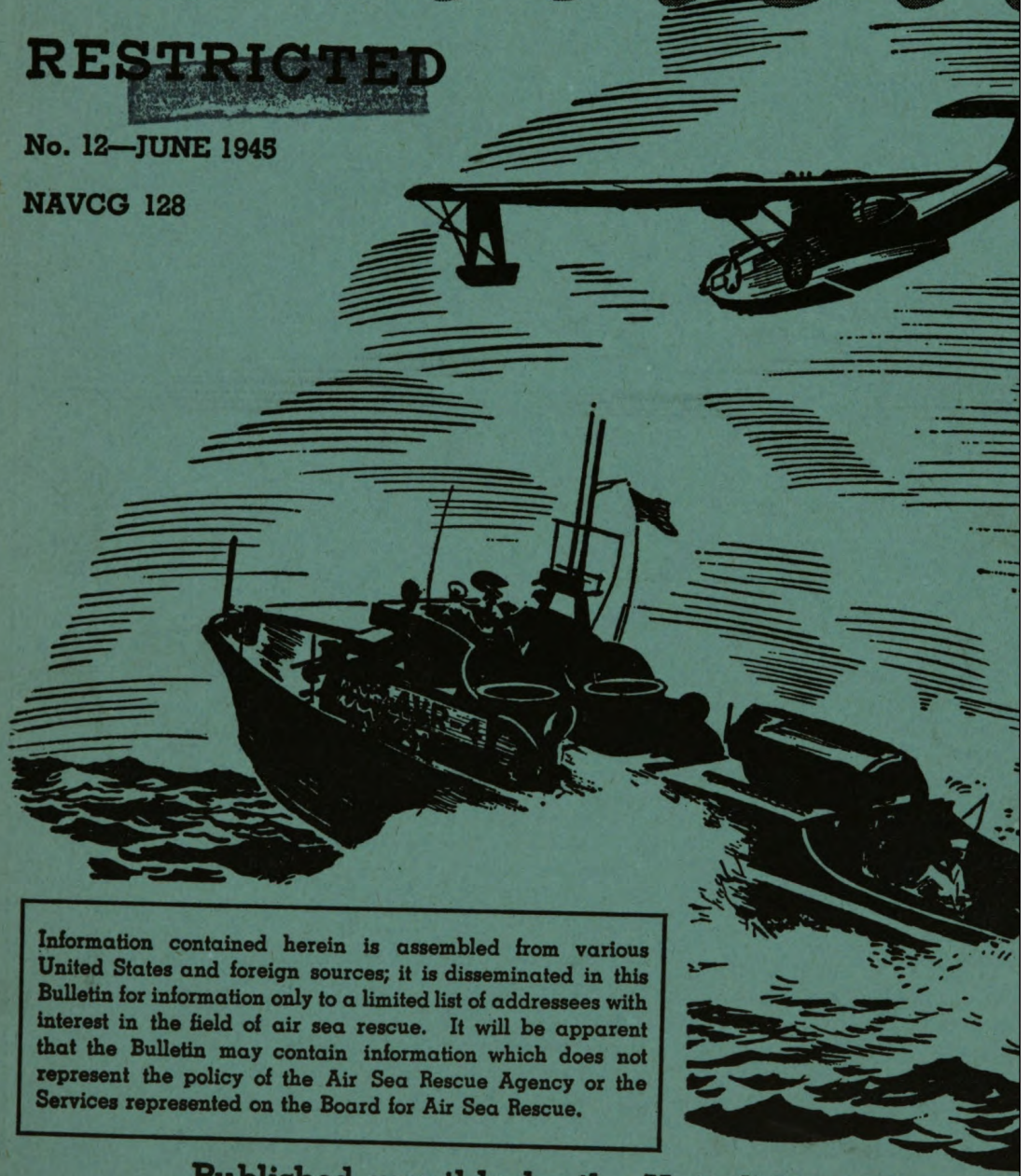
AIR SEA RES

Bulleti

RESTRICTED

No. 12—JUNE 1945

NAVCG 128



Information contained herein is assembled from various United States and foreign sources; it is disseminated in this Bulletin for information only to a limited list of addressees with interest in the field of air sea rescue. It will be apparent that the Bulletin may contain information which does not represent the policy of the Air Sea Rescue Agency or the Services represented on the Board for Air Sea Rescue.

Published monthly by the United States Coast G

AIR SEA RESCUE A

WASHINGTON, D. C.

AIR SEA RESCUE AGENCY

R. R. WAESCHE, Admiral
U. S. Coast Guard

ROBERT DONOHUE, Rear Admiral
U. S. Coast Guard

BOARD FOR AIR SEA RESCUE

C. V. WHITNEY, *Colonel*, U. S. Army Air Forces
J. W. BURGARD, *Lieutenant Colonel*, U. S. Army Air Forces
W. J. RENN, *Lieutenant Colonel*, U. S. Army Service Forces
JAMES R. DUDLEY, *Captain*, U. S. Navy
P. K. WILL, JR., *Commander*, U. S. Navy

Executive Staff for Air Sea Rescue

W. A. BURTON, *Commander*, USCG, Executive Assistant
G. W. NELSON, *Commander*, USCG, Executive Officer
W. B. SCHEIBEL, *Commander*, USCG, Secretary of the Board
J. H. BELL, *Lieutenant*, USCGR, Chief of Information Section

Special Duty Staff Officers, Air Sea Rescue Agency

C. M. MURPHY, *Major*, AC, Army of United States
RUSSELL E. PIERCE, *Captain*, USMCR
E. J. SANGER, *Lieutenant*, USNR

AIR SEA RESCUE LIAISON OFFICERS

R. L. BURKE, *Commander*, USCG
Air Sea Rescue Liaison Officer
Commander Eastern Sea Frontier
90 Church Street
New York 7, N. Y.

T. J. HARRIS, *Commander*, USCG
Air Sea Rescue Liaison Officer
% Commander Western Sea Frontier
Federal Office Building, Room 469
San Francisco 2, Calif.

A. E. HARNED, *Commander*, USCG
Air Sea Rescue Liaison Officer
Hut 33
Staff Commander, 7th Fleet
Fleet Post Office
San Francisco, Calif.

A. J. DEJOY, *Commander*, USCG
Air Sea Rescue Liaison Officer
Air Sea Rescue Unit
Naval Air Base, Navy 3245
% Fleet Post Office
San Francisco, Calif.

R. A. BAXTER, *Commander*, USCG
Air Sea Rescue Liaison Officer
% Commander Gulf Sea Frontier
Dupont Building, Room 926
Miami, Fla.

D. O. REED, *Commander*, USCG
Air Sea Rescue Liaison Officer
Coast Guard Box #1, Navy 48
% Fleet Postmaster
San Francisco, Calif.

O. D. WEED JR., *Commander*, USCG
Air Sea Rescue Liaison Officer
% Commander, Alaskan Sea Frontier
Fleet Post Office
Seattle, Wash.

CONTENTS

Communications to AIR SEA RESCUE BULLETIN should be addressed:

AIR SEA RESCUE BULLETIN
Air Sea Rescue Agency
1516 Fourteenth Street N.W.
Washington 5, D. C.

s down ramp in normal flight positions. On "crash preparation" signal—one blast on horn—each man accomplishes his assigned duties ies ditching position.

and Training Teach Airmen to Ditch and Live

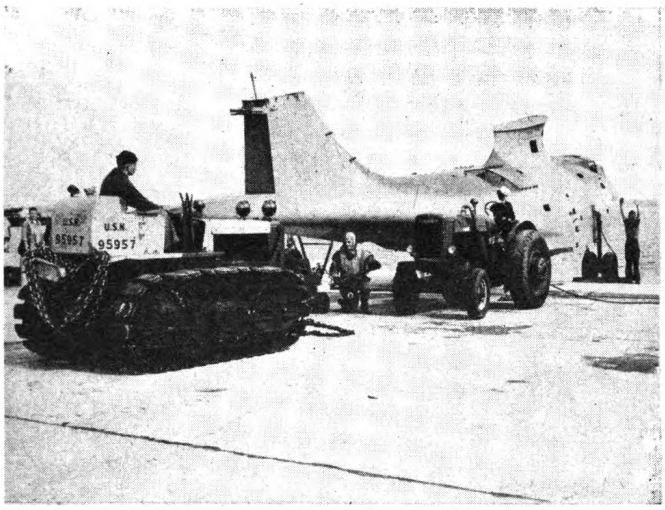
drill and survival training ınd aircrewmen, conducted the Physical Training and ıining Departments at the Naval Air Station, are an an over-all program which pre-flight and continues rimary and intermediate pilots, and trade and gun- s for aircrewmen. The es- fundamentals have already ed on, and the survival dertaken here complements aining.

ıing was started in Novem- nd as of 1 March 1945 over ınd 1,150 aircrewmen, com- crews, have checked through s and drill.

The training, designed to prepare pilots and crews, individually and as a team, to land and live under any emergency conditions, begins at the survival "hut" on Seaplane Point. Here the bulkheads are lined with display boards mounted with all types of emergency gear. In one corner is a Gibson Girl, and at one end of the hut an inflated life raft is rigged with sails. Display boards of improvised or homemade equipment, such as fish hooks fashioned from keys for opening tinned rations, water dippers from bamboo stalks, fishing line and twine from mulberry root, and crude sandals improvised from coconut hulls hang from the bulkheads and rafters. These visual aids graphically demonstrate what can be done with a little ingenuity and know-how from seemingly useless articles.

Into this realistic setting is introduced the series of five lectures covering every phase of survival. The training is minimal but is designed to cover a wide variety of emergency conditions with easily remembered principles of survival. Because of administration problems involved, the lectures are set up as separate topics of instruction which can be presented in any sequence. Ditching drill, which is carried through a chronological sequence in the accompanying illustrations, is an extension of the general survival training.

The first lecture covers general sur-



Left—PBY hull set up for ditching drill. Right—crew loading gear aboard. Depicts equipment that has potential survival value in an emer

vival principles including the following topics: self-preparation; equipment problems; improvisation and common sense; morale; abandon-ship principles; short- and long-term survival problems such as travel versus setting up camp, food and water, wounded or sick members; contact with natives; problems in hostile or enemy-held territory; travel hints; environmental hazards, and medical exposure problems. The other lectures deal with survival at sea, survival on land, special land areas, emergency signals, and a final check on personal survival which includes Mae West life jacket drills and parachute harness drills.

A PBY hull is used for the ditching drill which provides an opportunity for the crew members to practice an actual emergency landing at sea. Th ous tension of abandoning shi seconds count, and the sensa feeling water creeping up arou legs are created to impress on th the need for clockwork precis stantaneous action, and thorou Through these drills, which a grated with the lectures on s

(*Continued on*

Below—abandoning plane. Water rushes in through holes drilled in aircraft hull.

Right—breaking out raft and readying emergency equipment to load aboard. Note officer clocking the procedure.

Above—as the plane settles in the water the crew is waterborne an way from the immediate vicinity.

Determining Distance, Course and Speed of a Vessel From a Life Raft

to estimate distance at sea, t is the distance of a ship or nay be helpful to a survivor a raft or boat. It has been that the survivor, attempting .te the distance from his raft ıted vessel, might apply the sed by the Coast Guard in its the Hawaiian Sea Frontier)efense Lookout System to de- :ourse and speed of incoming ır docking time estimates.

ıtion of the method would re- additional equipment. The maneuvering board and visi- .rt could be inserted in the sur- klets already standard in raft oat equipment.

, the distance of the horizon :termined by taking the square ıe distance, in unit of measure, from the level of the sea to the observer's eye, and multiplying it by 1.15.

When a survivor is able to see part of a ship above the horizon and can form an idea of its type—destroyer, cargo ship, transport, etc.—estimating the height above the water line of that portion of the vessel which is level with the horizon, together with the information on the accompanying chart, will furnish a fairly accurate estimate of the distance between the vessel and the raft.

Harold Gatty states in his *Raft Book:* "The importance of this calculation is obvious when you consider the valuable energy which may be expended uselessly in an endeavor to reach an object whose actual distance is far greater than at first thought."

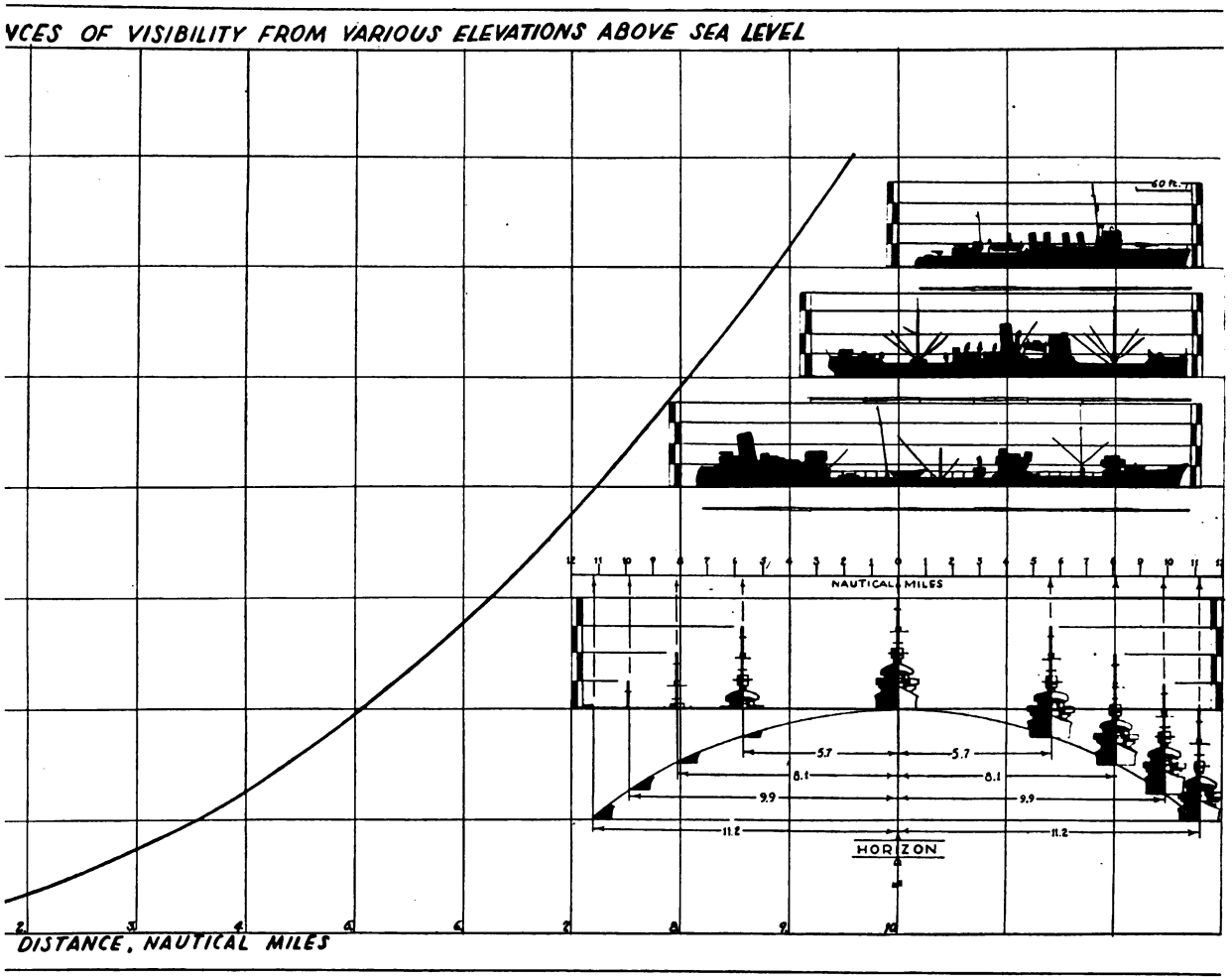
A maneuvering board will aid the survivor in working out problems of distance. The proper use of this board will enable him to determine the distance from the raft to a ship and to calculate the ship's approximate true course and speed.

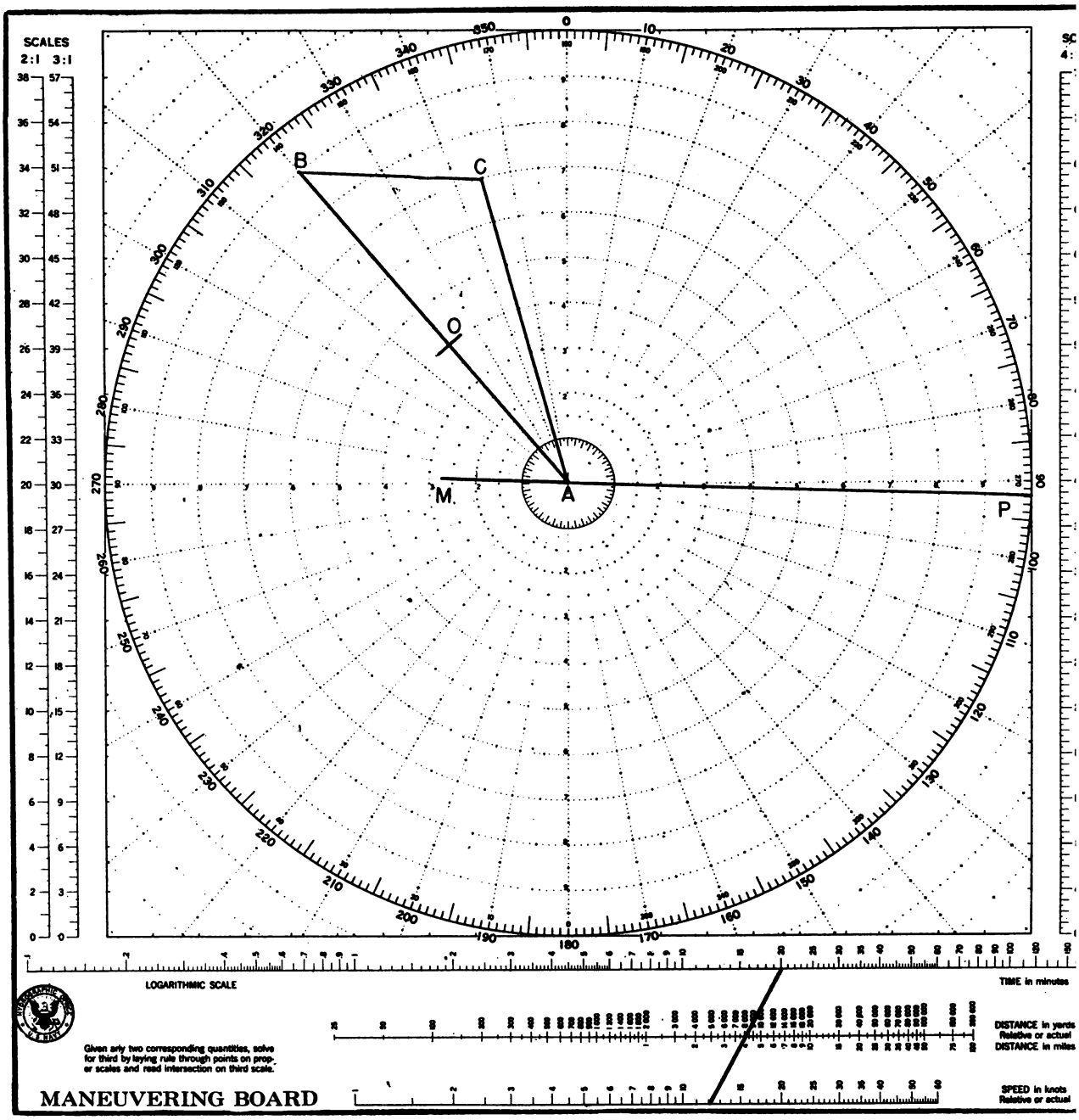
PELORUS

The pelorus, an instrument which facilitates taking bearings from various points on land, or convenient positions aboard ship, is sometimes called a dumb compass because it has no power to indicate true direction. A makeshift pelorus can be made by placing pins or small nails on the maneuvering board to act as a sighting vane. Thus by using the small compass, which is contained in the various survival kits, the castaway is able to take a fairly accurate bearing.

MANEUVERING BOARD

The maneuvering board is a plotting sheet consisting of 10 equidistant con-





centric circular circumferences of which the tenth or outer one is graduated in degrees. The distance between the successive circumferences may represent any unit of distance, miles or yards. Radii are drawn from the center at intervals of 10°.

The center of the concentric circles, or the base point, is the position of the observer. As the vessel is sighted, a bearing is first taken and marked on the maneuvering board. From the chart showing the distances of visibility from the various elevations above sea level, the distance from the base point is determined. Following is an illustration of the principle involved:

A ship is sighted bearing 320° and estimated to be 9 miles from the observer (point A). Since the successive circumferences may represent any unit, the line AB is drawn from the base point to the ninth circle. Twenty minutes later another bearing is taken, and the ship is found to be bearing 345° at an estimated distance of 7 miles from point A. The line AC is drawn from the base point to the seventh circle. By connecting the two points B and C, and drawing the line BC, the course of the ship and the distance it traveled during minutes can be determined.

Using a string or a piece of which has been marked to the le the line BC, the marking is pla point A and carried along the li This distance is marked by the p The line AO is found to extend the line AB to the fourth circle the distance traveled by the ship the 20 minutes is 4 miles.

By using the logarithmic scale maneuvering board and connecti time (20 minutes) and the dista

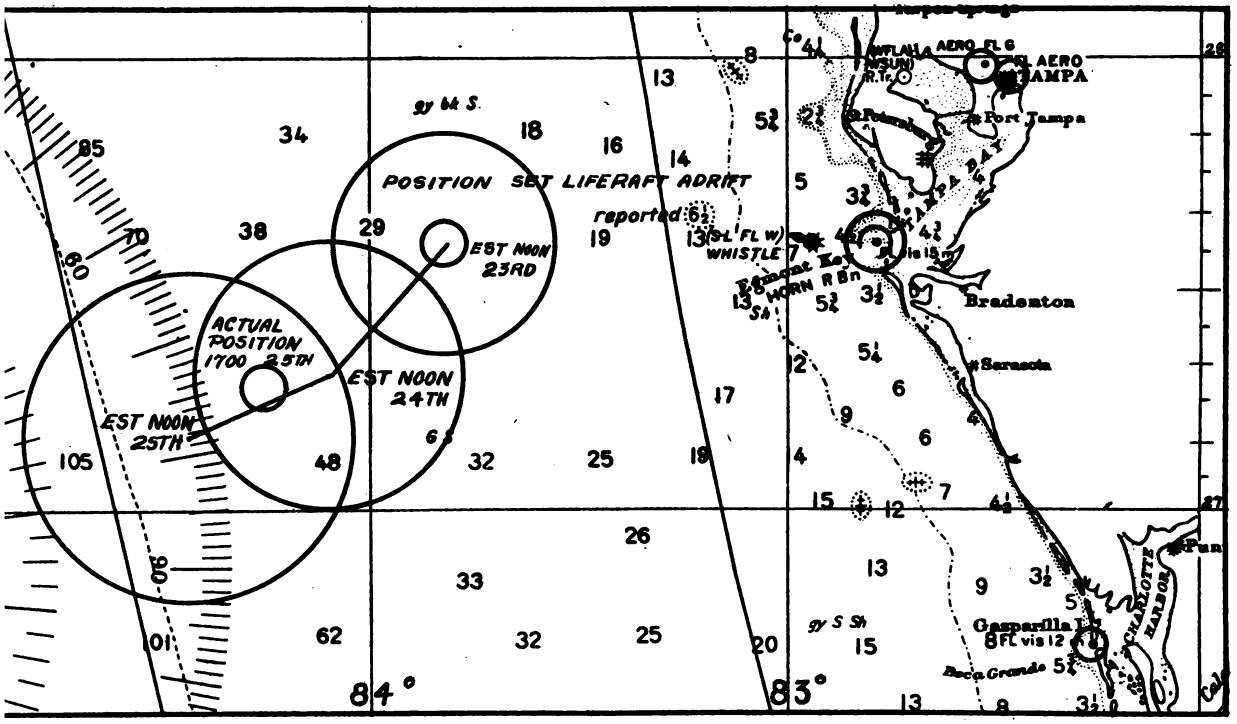
(*Nex*

t from preceding page)

ıe speed is determined by draw- ; through these two points and ; it to the scale which gives l in knots. The speed is then be 12 knots. To find the course ıse l the line MP is drawn parallel to the line BC through point A to the outer ring of the maneuvering board, which shows that the course upon which the vessel is traveling is 092°.

The computations will supply the survivor with the information that the ship which he originally observed is 7 miles away, making 12 knots, and traveling on a course of 092°. With this information he is able to estimate the best time to fire his pyrotechnics, or to determine if it is possible to intercept the ship by sailing or paddling his raft on a set course.

AST GUARD AIR STATION TESTS H.O. 235



ıns of an actual search prob- Coast Guard Air Station at sburg, Fla., recently tested the f H. O. 235 in computing the ı life raft at sea. This test, d over a 3-day period under perating conditions, embraced program:

est the efficacy of H. O. 235 ls for Locating Survivors Sea on Rubber Rafts").

etermine radar visibility with flector in life raft at various

est abilities of navigators.

ɔractice execution of the ex- ıquare search.

determine the senior PPC's ɔ control other planes in a

etermine seaworthiness of life

etermine the efficiency of look-

ɔrdance with the problem, an ɔpped a two-man life raft at a point 55 miles, bearing 270° from Egmont Key Light (see accompanying chart). The raft, with drogue streamed, was equipped with corner reflector and carried two 100-pound bags of sand.

Two PBMs and one PBY proceeded to the scene, and during the first day searched for 7 hours without success. Although it was later determined that each plane must have passed over the raft at least three times, it was not sighted. Sea conditions were adverse, and naturally there was no means of signaling from the raft.

Nine hours search were carried out during the second day, based on the computation of where the raft should have been, but again the results were negative.

On the third day, "A PBM was dispatched at 1530; located the raft at 1700. However, the PBM passed nearly directly over the raft on a course into the sun and all forward and waist lookouts failed to sight the raft. The tail lookout sighted the raft."

The air station regarded the method used as satisfactory, since they found the raft within 12 miles of the predicted position. At that time, the circle of search was 22 miles in radius, and the raft had been adrift for 52 hours. It should be noted that the reflector was dismounted and hanging over the side—another point that possibly could have been remedied had the raft actually been manned.

In working out the problem, a form was used to assist and simplify the calculations. This form, listing all the variable elements making up the problem, precludes the omission of any of the items involved.

If and when other reports become available to support this information they will be considered for publication at a later date.

EDITOR'S NOTE: The method used is the same as that reprinted in AIR SEA RESCUE BULLETIN No. 5 (November, 1944), on page 2.

"SURVIVAL BIBLIOGRAPHY"

Compiled by Arctic, Desert and Tropic Branch, AAF

This is the second article in a series, reprinting the survival bibliography compiled by the Arctic, Desert and Tropic Branch; Hq., AAF Tactical Center, Orlando. The bibliography is divided into these headings:

A. General.
B. Arctic.
C. Tropic or Jungle.
D. Desert.
E. Ocean.
F. Air-Sea Rescue.

Last month's AIR SEA RESCUE BULLETIN carried the "General" listing. Following are the next two sections—"Arctic" and "Tropic or Jungle." The remainder will be published in the next issue of the BULLETIN.

Title, author, date, number pages, format	Issuing and distributing agency	Content
B. Arctic: Arctic Manual. Stefansson, Vilhjalmur. 1944. 556 pp. illus. $3.00. 5¼ x 7⅞ x 1½. Unclassified.	Published by The Macmillan Co., New York, N. Y.	The 1940 Air Corps Arctic Manual revised, enlarged, and published in one volume.
Arctic Manual (2 Vols.) 1940. Unclassified.	Published by War Dept. Superintendent of Documents, Government Printing Office, Washington, D. C. (Out of print.)	Detailed description of the American Arctic, its fauna and flora, and techniques of living in the Arctic. Instructions for snow houses, skin clothing, preparation of native foods.
Arctic Manual. T. M. 1-240. 1942 (1 April). Revised 17 Jan. 1944. 131 pp. 21 Illus., 8½ x 5½ (x ¼). Unclassified.	Published by War Dept. Superintendent of Documents, Government Printing Office, Washington, D. C. *Obtainable* through normal channels used in ordering War Dept. publications.	Brief orientation on the American Arctic geography, climate, fauna and flora, shelter, travel, and outline of procedures for air crews if forced down.
Arctic Emergencies n. d. 65 pp. Cloth snap cover 4½ x 5⅝. Unclassified.	Published by Flight Control Command, Safety Education Division, Winston-Salem, N. C. (Superseded by Item A-11.)	A brief pocket guide for use in emergency kits.
Operations in Snow. Military Training Pamphlet No. 62. 1943 (Dec.). Unclassified.	Published by British War Office. *Obtainable from:* British Staff, and Foreign Liaison Section, MIS G-2, WDGS, Washington, D. C.	Winter tactics for ground forces. Descriptions of bivouacs, snow and ice bridges, ice concrete, and other snow engineering.
Arctic Sense. 1943 (Aug.). 29 pp. 7¼ x 9½. Unclassified.	Published by and *obtainable from:* Training Division, Bureau of Aeronautics, U. S. Navy, Washington, D. C.	Popular bulletin with cartoons illustrating precautions to be taken in Arctic flying.
Aleutian Sense. 1943 (July). 31 pp. Illus. 7¼ x 9½. Unclassified.	Published by and *obtainable from:* Training Division, Bureau of Aeronautics, U. S. Navy, Washington, D. C.	Popular account, with humorous cartoons, of geography, climate, and operational difficulties in the Aleutians.
Edible Plants of the Arctic Region NAVMED 119. Standley, Paul C. 1943. 49 pp. 27 Illus. 5⅛ x 7½. Unclassified.	Published by and *obtainable from:* Bureau of Medicine and Surgery, U. S. Navy, and War Dept., Superintendent of Documents, Government Printing Office, Washington, D. C.	Authoritative descriptions of plants of American Arctic.

(*Next page*)

Airborne Lifeb Rescue in North

The Fifth Emergency Rescue ron adeptly figured in a North cue making the first AAF airbo boat drop in the action. The lif new piece of squadron equipme prepared for inspection and den tion for two AAF generals and subject of considerable interest.

"The Generals had not left tion more than five minutes, w got a call that six men were d the North Sea off the coast mark," says the narrative of th who set up the boat. "We imm went to work like fiends—on working on a B-17 cutting hole bomb-bay doors for the support another gassing up the boat, d the self-righting chambers, etc little more than an hour we were way."

Although the raft was spotted 2 hours, conditions were very p 35-mile-per-hour wind whipped caps on the surface and tossed t with its six huddled passengers cork. The temperature was only

Twelve minutes after the bo been cut loose from the plane t vivors were in it and under wa engines turning over. Speed a ciency here bring credit both plane and the survivors. Th made one dry run, at which time bombs were dropped to mark th position. On the next run the b released and fell within 100 feet raft. Luck played a part, too, of the rocket lines went right ac raft!

A gale came up very shortly a men made the boat. A torpe sent out to meet the survivors an them was stopped by 60-mile wi 20-foot waves, in one of the year' North Sea storms.

"As the storm came up the su headed their boat right into both engines going at full throtl for 32 hours without stopping o til both fuel tanks were dry.

"The men were fine until th gave out. We tried to find them planes to drop more gas, but th was so bad that we could not spo When their gas ran out the boat abeam to the seas before they c their sea anchor out. A tren

(Ne

bliography (Continued)

r, date, number pages, format	Issuing and distributing agency	Content
Arctic Survival. 1943 . 6 pp. 8¼ x 11. Re-	Published by Hq., North Atlantic Wing, ATC. Presque Isle, Me. *Obtainable from:* Hq., North Atlantic Division, ATC, Lincoln and Silver Sts., Manchester, N. H.	Brief instructions for eastern American Arctic, signals, shelter, health precautions.
ts and Berries of North- ada. Porsild, A. E. pp. 12 figs. Unclassi-	Published by and *obtainable from:* National Museum of Canada, Dept. of Mines and Resources, Ottawa, Canada.	Accurate descriptions of plants and their uses.
rrior's Reminder. 1942. imeo. Unclassified.	First U. S. Special Service Force. (Out of print.)	Instructions on snow shelters, snow camouflage, and mountain-craft.
: General Conditions. —Nine School Lectures— . Second revision May pp. Map. 8 x 10½. fied.	*Obtainable from:* ADT Branch, AFTAC, Orlando, Fla.	Instructors' manual. Definition of Arctic and sub-Arctic, geography of sea and land, climate, flora and fauna, settlement, maintenance, and health.
c: Survival. ADTIC— hool Lectures—A-III, evised 1944. 24 pp. 8 x 10½. Unclassified.	*Obtainable from:* ADT Branch, AFTAC, Orlando, Fla.	Instructors' manual. Principles of Arctic living, use of clothing, signaling, food, travel, and health precautions.
Living in the Arctic. Bulletin 6, 1944 (1 Feb.). 45 illus. 7¼ x 9½. fied.	*Obtainable from:* ADT Branch, AFTAC, Orlando, Fla. (Superseding "Living Off the Arctic" 1943.)	Lists items to be included in emergency kits, details action to be taken when forced down, including signaling first aid, clothing, shelter, plant and animal life, Eskimo vocabulary.
ersonnel in the Arctic. Bulletin 8, 1943. Revised 1944. 12 pp. 11 illus. Unclassified.	*Obtainable from:* ADT Branch, AFTAC, Orlando, Fla.	Use of clothing, health and first aid, morale factors.
uito and Fly Problem ctic. ADTIC Bulletin (10 Feb.). 7 pp. 5 Illus. . Unclassified.	*Obtainable from:* ADT Branch, AFTAC, Orlando, Fla.	Descriptions of annoying insects, their breeding places, and protective measures.
Conditions in Arctic ADTIC Medical Se- No. 1. 1943. Revised 4. 8 x 10⅛. Unclassi-	*Obtainable from:* ADT Branch, AFTAC, Orlando, Fla.	Acclimatization, maintenance of body heat, frostbite, snow-blindness, and notes on sanitation.
of Injuries Due to DTIC Medical Series 1943. Reprinted April p. 8 x 10½. Unclas-	*Obtainable from:* ADT Branch, AFTAC, Orlando, Fla.	Discussion of frostbite.
for Winter Ski Train- phlet No. 6—Cana- Training. 1941. 124 7¾. Unclassified.	Published by Edmond Cloutier, Kings Printer, Ottawa. *Obtainable from:* Foreign Liaison Section, MIS G-2. WDGS, Washington, D. C.	Instructional manual for ski troops, with special attention to bivouacs in timbered country.
n Snow and Extreme M. 31-15. 1941. (C- il and Sept. 1942.) x 7½. Unclassified.	Published by War Dept., Superintendent of Documents, Government Printing Office, Washington, D. C. *Obtainable* through normal channels used in ordering War Dept. publications.	General instructions for all arm with special attention to tactic of winter warfare.

(*Next page*)

Airborne Lifeboat Rescue (Continued)

coamer hit the boat, throwing three men on deck right into the water, snapped off the center board and completely flooded the boat until nothing but the self-righting chambers and one gunwale were above water.

"One of the men in the boat threw the toss line to the men in the water. The three got back aboard and the boat rose slowly as the water drained out of her.

"They got the sea anchor out, baled her, and rode it out until the torpedo boat got their bearing from the Gibson Girl radio and homed on their signal. Until the third day the wind was too strong to fly the antenna kite of the Gibson Girl."

The torpedo boat met the lifeboat on the third day and brought the men back safely to England. Although all but two of the men had to be lifted aboard the rescuing boat, the worst effects of their journey were mildly frostbitten feet. Due to rough weather it was impossible to salvage the lifeboat, which had to be sunk by gunfire.

No conclusions need be drawn as to the probable fate of the six survivors in the absence of the airborne lifeboat. Note should be made of the valuable contribution of the Gibson Girl in helping to effect the rescue.

PUBLICATIONS CATALOGUED

Air Sea Rescue Technical Library

28 April—30 May 1945

THESE PUBLICATIONS ARE NOT AVAILABLE FOR DISTRIBUTION AT THE AIR SEA RESCUE AGENCY, BUT MAY BE USED BY QUALIFIED PERSONS.

REFERENCE

U. S. Army Air Forces.
Army Air Force Installations Directory . . . 1 July 1944. Washington, D. C., 1944. (Restricted.)

U. S. Army Air Forces. Office of Flying Safety *Pilots' Information File.* Detroit, Mich., 1944 to date. (Restricted.)

U. S. Navy Dept. Bureau of Aeronautics.
Aviation Circular Letter No. 0-45. Reprint of all aviation circular letters in effect. (Washington, D. C.) 1945. (Restricted)
Index of Technical Orders and Technical Notes . . . January 1945. Washington, D. C., U. S Govt. Print. Off., 1945.

(*Next page*)

Survival Bibliography (Continued)

Title, author, date, number pages, format	Issuing and distributing agency	Content
Read and Live. Westover, Maj. J. F. n. d. 3¾ x 5¼. Unclassified.	Published by and *obtainable from:* Search and Rescue Officer, Hq., Alaska Division, ATC, APO No. 462, c/o P. M. Minneapolis, Minn.	Brief manual applying especially to northern Canada and Alaska; tells how to operate "Gibson Girl" radio in dense timber.
RCAF Manual of Winter Operations. C. A. P. 1942 (Mar.) 141 pp. Illus. 5 x 8. Unclassified.	Published by Hq., RCAF, Ottawa. *Obtainable from:* Foreign Liaison Section, MIS G-2, WDGS, Washington, D. C.	Primarily concerned with operation of aircraft, but contains practical suggestions on emergency kits, food, and clothing in case of forced landing. Based on experience of bush pilots.
Safety North: Orientation for North America and Adjacent Islands north of the 50th parallel. Gates, Cpl. Roy P. n. d. Unclassified.	Published by and *obtainable from:* S-2 Section, First Mapping Group, Bolling Field, Washington, D. C.	Brief description of survival problems in the eastern American Arctic.
Instructions for Arctic Operation. 1942 (20 Oct.) (20 Nov.) AAF T. O. 01-1-67. Revised 1943 (1 Aug.) (20 Sept.). AAF T. O. 00-60-3. 33 pp. Illus. 8⅛ x 11. Restricted.	Published by AAF Air Service Command, Patterson Field, Fairfield, Ohio. *Obtainable from:* Air Technical Service Command, Maintenance Division, (AAF Form 102), Patterson Field, Fairfield, Ohio, or from Chief, Bureau of Aeronautics, U. S. Navy, Washington, D. C.	General instructions for winter maintenance of aircraft. Sections 3-8 deal with care of personnel and survival.
Handbook of American Mountaineering. Henderson, Kenneth A. 1942. 239 pp. Cloth $2.50. 4⅞ x 7⅝. Unclassified.	Published by The American Alpine Club. *Obtainable from:* Houghton Mifflin Co., Boston, Mass.	The American Alpine Club manual of mountaineering technique. Chapters on glacier travel, snow and ice, climbing and bivouacs of special value in Arctic survival, since ice-cap survival procedures are not covered in other manuals.
Handbook of Ski Mountaineering. 1942. $1.50. Unclassified.	Published by and *obtainable from:* University of California Press, Berkeley, Calif.	Detailed instructions on winter bivouac, food, clothing, route-finding, first aid, and health.
Boats for Arctic Travel. Victor, 1st Lt. Paul A. 1943. Mimeo. Unclassified.	Published by Arctic Training School, Buckley Field, Colo. *Obtainable from:* Arctic Training School, APO No. 462, c/o P. M., Minneapolis, Minn.	Instructions for building and using small boats in Arctic waters.
Procurement of Animal Food for Living in the Arctic. Victor, 1st Lt. Paul A. 1943. Illus. Mimeo. Unclassified.	Published by Arctic Training School, Buckley Field, Colo. *Obtainable from:* Arctic Training School, APO No. 462, c/o P. M. Minneapolis, Minn.	How to take, skin, prepare, and store animal food.
Overland Navigation. 1943. Mimeo. Unclassified.	Published by Arctic Training School, Buckley Field, Colo. *Obtainable from:* Arctic Training School, APO No. 462, c/o P. M. Minneapolis, Minn.	Methods of route-finding and keeping track of progress in snow-covered terrain.
Avalanches. Rybizka, Benno, n. d. Mimeo. Unclassified.	Published by and *obtainable from:* National Ski Patrol System, 415 Lexington Ave., New York, N. Y.	Brief description and precautions to be used in avoiding and escaping from avalanches.
The National Ski Patrol System Manual. 1941. 117 pp. 4½ x 6¾. Unclassified.	Published by and *obtainable from:* National Ski Patrol System, 415 Lexington Ave., New York, N. Y.	Notes on first aid and evacuation of injured in snow and extreme cold.

(*Next page*)

Publications (Continued)

Naval Aeronautic Publications I March 1945. (Washington D. C., U Print. Off.) 1945. (Restricted.)

AIR-SEA-LAND-RESCUE SEI

Eastern Sea Frontier, *Brunswick, Me. Air Sea Rescue Operation Report* No. Brunswick, Me., ASRTU Naval A 1945. (Restricted.)

Eastern Sea Frontier, *Norfolk, Va. Air Sea Rescue and Search Report,* No. Norfolk, Va., Air Sea Rescue Task U Naval Air Station, 1945. (Restrict

Eastern Sea Frontier, *Quonset Point, R. Crash and Rescue Report,* No. 1 to dat set Point, R. I., Air Sea Rescue T U. S. Naval Air Station, 1944–45. (R

Gulf Sea Frontier, *Miami, Fla. Distress Operations Report Summary, Ja to date.* Miami, Fla., Air Sea Resc Seventh Naval District, Joint Opera ter, Gulf Sea Frontier, 1945. (Restri

U. S. Air Transport Command. Cari vision. *Air Sea Rescue Manual.* (V Beach, Fla.) 1944.

U. S. Coast Guard Air Station, *Elizabeth Pilot Report of Offshore Landing,* 1– Elizabeth City, N. C., 1945.

U. S. 11th Naval District. *Rescue of Personnel from Aircraft (Land within the Eleventh Naval Dis* Diego, Calif., 1944.

Western Sea Frontier. *Offshore Landings by Rescue Aircra* 1944. San Francisco, Calif., Staff I ters, Federal Office Building, 19 stricted.)

Western Sea Frontier, *Northern Califor Air Sea Rescue Operation Plan No.* Francisco, Calif., Headquarters Treas 1944. (Restricted.)

CLOTHING

National Research Council. Committe tion Medicine. *Report No. 390: Clo Methods,* edited by L. H. Newburgh Milton Harris . . . Washington, D.

DITCHING

U. S. Army Air Forces. I Troop Car mand. *Stout Field, Indianapolis, I Have Been Ditched.* Indianapolis, I *Training Guide No. 8:* C-47 *Ditch* Indianapolis, Ind., 1944.

EMERGENCY EQUIPME

Air-Ground Voice Communication Equi port of Airborne Test. (Washingtc Coast Guard Headquarters.) 1945.

Bell Telephone Laboratories, Inc., *Descriptive Specification of Airborne Equipment.* (New York.) 1945.

Eastern Sea Frontier, *Salem, Mass. Report of Experimental Dropping of Kits* . . . Salem, Mass. Air Sea Re Unit, U. S. C. G. Air Station, Northe Eastern Sea Frontier, 1945. (Restri

Fishing Instructions; Vest-Type Parach gency Kit . . . Dayton, O., Wright F

General Aircraft Corporation, *Astoria, Preliminary Data, Ambulance and Rescue Airplane,* Submitted by the Ge craft Corp., Astoria, L. I., N. Y., 194

(*N*

ography (Continued)

late, number pages, ormat	Issuing and distributing agency	Content
)n the Battlefield. A. 1943. 158 pp. ı. 6¼ x 9¼ x 7.	Published by and *obtainable from:* S. A. Barnes and Co., New York, N. Y.	Largely historical. Ch. XIV gives hints on clothing, etc., and ch. VIII on shelters.
iples Governing Se- othing for Cold Cli- ple, P. A. 1944 meo. Unclassified.	Published by and *obtainable from:* Office of Quartermaster General, Temporary Building A, 2d and T Sts. SW., Washington, D. C.	Clothing requirements based on climatic data, and experimental data on insulation needs of men doing different kinds of work.
r Clothing. W. D. ircular 37. 1943 (19 classified.	Published by War Dept., Washington, D. C. *Obtainable* through normal channels used in ordering War Dept. publications.	Principles and instructions for care and use of QM clothing.
Cold Weather Equip- D. Training Circular Mar.). Unclassified.	Published by War Dept., Washington, D. C. *Obtainable* through normal channels used in ordering War Dept. publications.	Operation and maintenance of QM equipment.
First Aid. 1940. 43 6 x 9. Unclassified.	Published by and *obtainable from:* American National Red Cross, Washington, D. C.	First aid and evacuation of injured on snow.
oods in the Aleutians. dy). Colored illus. nclassified.	Compiled by G-2 Alaska Defense Command. *Obtainable from:* Hq. Western Defense Command, AC of S, G-2, Presidio of San Francisco, Calif.	Descriptions with illustrations of edible berries and other plants found in Aleutians.
ter Warfare. MIS es No. 18. 1943 (15 pp. 92 Illus. 5½ x cted.	Prepared by Military Intelligence Division, War Dept. *Obtainable from:* MIS G-2, WDGS, Washington, D. C.	Many valuable ways of making winter bivouac, notes on clothing, food, winter travel.
ıtain Warfare. MIS es No. 21. 1944 (29 pp. 40 illus. 5½ x cted.	Prepared by Military Intelligence Division, War Dept. *Obtainable from:* MIS G-2, WDGS, Washington, D. C.	Instructions in mountaineering techniques.
Manual. Harper, 13. 393 pp. Illus. 8¼. Unclassified.	Published by and *obtainable from:* Military Service Publishing Co., Harrisburg, Pa.	Much information on snow bivouacs, glacier and mountain travel.
the Arctic. 1943. pp. Mimeo. Re-	Published by Airlines War Training Institute, 1740 G St. NW., Washington, D. C. (Superseded by Item A-1.)	List of equipment necessary, signaling, fire building, shelter, care of personnel, and first aid.
Information Pam-	Published by and *obtainable from:* Search and Rescue Section, Second Air Force, Colorado Springs, Colo.	Primarily instructions for searching parties: Contains directions for overland travel and route-finding.
ngle: o air crews. Notes d Traveling in New pua, New Britain, rn Australia. 1942.	Published by Directorate of Intelligence, Hq., Allied Air Forces, Southwest Pacific Area. *Obtainable from:* MIS G-2, WDGS, Washington, D. C.	Brief description with observations on native tribes.
ng to the South Pa- (Aug.). 23 pp. 4⅜ sified.	Prepared by Commander, Air Force Pacific Fleet. Reprinted by Bureau of Aeronautics. *Obtainable from:* Air Information Branch, Bureau of Aeronautics, U. S. Navy, Washington, D. C., or ADT Branch, AFTAC, Orlando, Fla. (ADTIC Digest Series 1, No. 1, 15 Mar. 1943.)	Brief notes on clothing and life at island bases.

(*Next page*)

Publications (Continued)

Naval Medical Research Institute, *Bethesda, Md. Evaluation of the International Latex Corporation Raft for Stokes Stretcher.* Bethesda, Md., 1945. (Its Research Project X-109B.)

U. S. Air Sea Rescue Agency. *Air-Sea Rescue Equipment Guide.* NAVCG-117 . . . Washington, D. C., U. S. Govt. Print. Off., 1945. (Restricted.)

U. S. Air Technical Service Command. Engineering Division. *Emergency Rescue Equipment Status Report Jan., 1945 to date.* Dayton, O., Wright Field, 1945.

U. S. Army Air Forces. *Emergency Uses of the Parachute, Feb., 1945.* Washington, D. C., 1945. (AAF Manual No. 60-1.)

U. S. Army Air Forces. School of Applied Tactics. *Hitting the Silk,* a Manual on the Care and Use of the Parachute, by Air-Sea Rescue Branch, Strategic Bombardment Division, Combat Operations Dept., AAF School of Applied Tactics, AAF Tactical Center. Orlando, Fla., 1944. (Restricted.)

U. S. Army Air Forces, School of Applied Tactics. Aero Medical Dept. *Reference Manual for Personal Equipment Officers.* (Orlando, Fla.) 1944. (AAF Manual 55-3) 1 September, 1944. (Restricted.)

U. S. Coast Guard Air Station, San Diego, Calif. *Test of Pocket Bubble Sextant.* San Diego, Calif., 1944.

U. S. Pacific Fleet Air Force. *Air Force, Pacific Fleet, Technical Bulletin No. 49TB44. Aviation Equipment Technical Information Pertaining to.* 22 Oct., 1944.

(U. S. Coast Guard Air Station, San Diego, Calif.) *Experiments with the PBM 3S and its Suitability (to the Lindholme Dinghy Rescue Gear.* (San Diego, Calif.) 1944.

LOCALE INFORMATION

China Sense or Rice-Paddy Tales. 15 March 1945. (CINPAC-CINPOA.) (Restricted.)

Cranwell, Lucy M.
Food Is Where You Find It; a Guide to Emergency Foods of the Western Pacific by L. M. Cranwell, N. E. Green, and A. W. B. Powell. Auckland, New Zealand, Auckland Institute Museum, 1943.

NAVIGATION

U. S. Hydrographic Office.
1943 Radio Navigational Aids, Including Details of Direction-Finder Stations, Radio Beacons, Navigational Warnings, Time Signals, etc., Washington, D. C., U. S. Govt. Print. Off., 1943. (H. O. 205.)

RESCUE CRAFT

U. S. Coast Guard.
Types of Coast Guard Vessels. Washington, D. C., 1945. (Restricted.)

SIGNALS AND SIGNALING

Gt. Brit. Air Ministry.
Air Publication, 1641H, Vol. I, Chapter 5; 1661E, Vol. I. Sect. I, Chapter 6 and 8; Sect. 4, Chapter 9; Sect. 5, Chapter 3; Sect. 7, Chapter 3; Sect. 15, Chapter 11. (Restricted.)

Joint Communications Board.
Joint Emergency Rescue Communications Procedure. Washington, D. C., 1945. JANP 107. (Restricted.)

U. S. National Bureau of Standards.
Development of Washer-Type Emergency Signaling Mirror. Washington, D. C., 1945.

(*Next page*)

Survival Bibliography (Continued)

Title, author, date, number pages, format	Issuing and distributing agency	Content
Castaways Baedeker to the South Seas. 1942 (Dec.). 63 pp. 4¼ x 6. Unclassified.	Published by Objective Data Section, Intelligence Center, Pacific Ocean Areas, Army Printing Plant, Fort Armstrong, T. H. *Obtainable from:* Bernice P. Bishop Museum, Honolulu, T. H.	Notes on geography, fauna and flora, natives, animal and insect pests of tropical islands of Pacific. Instructions on native foods and use of plants. Life raft navigation.
Native Lore for Castaways in the South Seas. Emory, Kenneth, Bishop Museum Ethnologist. 1943 (Jan.) 19 pp. Illus. Mimeo. 8 x 10½. Unclassified.	Assembled from material in the collection of the Bernice P. Bishop Museum, Honolulu, T. H. *Obtainable from:* Bernice P. Bishop Museum, Honolulu, T. H.	Plant and animal food; shelter, clothing improvised from natural materials.
South Sea Lore. Special Publication 36. Bernice P. Bishop Museum. Emory, Kenneth P. 1943 (Sept.) 75 pp. 36 figs. 4½ x 6. Unclassified.	Published, copyrighted by and *obtainable from*: Bernice P. Bishop Museum, Honolulu, T. H.	Edible, poisonous, and useful plants and animals of Pacific Islands. Emergency uses for clothing, shelter, food, and first aid.
Escape from the Jungle. 1943 (27 July). Unclassified.	Published by and *obtainable from;* Fifth Fighter Command, APO No. 929, c/o P. M., Presidio of San Francisco, Calif.	Instructions for survival and travel in New Guinea.
Getting About in New Guinea. 1944 (4 April). Reprinted 26 Oct. 1943. 29 pp. Illus. 4¼ x 5⅝. Unclassified.	Published by Military Intelligence Division, Allied Geographical Section, General Hq., Southwest Pacific Area. *Obtainable from;* MIS G-2, WDGS, Washington, D. C.	What to do if lost in the bush, tracking, use of natives, stream and swamp crossing, rafts and canoes, shelter, food, trapping, avoiding pests.
Safety South—Orientation for Amazon-Orinoco-Parana River Valleys and Their Tributaries. Gates, Cpl. Roy P. 1944 (23 Feb.). 28 pp. Illus. Mimeo. 8 x 10½. Unclassified.	Published by and *obtainable from;* S-2 Section, First Mapping Group, Bolling Field, Washington, D. C.	Plant and animal life, personal care, water, precautions. Plate shows poisonous snakes.
Jungle and Desert Emergencies. n. d. 88 pp. Cloth Snap (cover another edition, cloth without snap). 4⅜ x 5⅝. Unclassified.	Published by Directorate of Air Traffic and Safety, and Directorate of Safety Education, Winston-Salem, N. C. (Superseded by Item A-11).	Notes on signaling, shelter, edible and poisonous plants and animals, trail craft and health.
Care of Personnel in the Wet Tropics. ADTIC Bulletin 9. 1943. Revised 25 Jan. 1944. 11 pp. 21 Illus. 7¼ x 9½. Unclassified.	*Obtainable from:* ADT Branch, AFTAC, Orlando, Fla.	Acclimatization, health, precautions, protection against insects, disease, and use of water and food.
Jungle Craft Training Course. Training Memorandum No. 1. 1944 (23 May). Unclassified.	Published by and *obtainable from:* Air/Sea Rescue Section A-3 ADVON, APO No. 713, Unit 1, c/o P. M., New York, N. Y.	Outline for training in Jungle survival.
Living off the Southwest Pacific Tropics. ADTIC Bulletin 5, 1944 (15 Jan.). 40 pp. 43 Illus. 7¼ x 9½. Unclassified.	*Obtainable from:* ADT Branch, AFTAC, Orlando, Fla.	Detailed description of edible plant and animal life and brief treatment of how to survive if forced down.
Living off the American Tropics. ADTIC Bulletin 10, 1944 (10 Feb.). 62 pp. 46 Illus. 4½ x 6. Unclassified.	*Obtainable from:* ADT Branch, AFTAC, Orlando, Fla.	Edible and poisonous plant and animal life found in Central and South American tropics, and brief description of survival procedures specially applicable to these regions.
Poisoning by Snakes, Plants and Fish. ADTIC Medical Series 1, No. 4. Revised May 1944. 17 pp. 8 x 10½. Unclassified.	*Obtainable from:* ADT Branch, AFTAC, Orlando, Fla.	Symptoms, treatment and identification of poisonous species.

(Next page)

Publications (Continued)

U. S. War Dept.
Radio Sets SCR-536-A, SCR-536-B a 536-C. May 14, 1943. Washington 1943. (Its Technical Manual TM (Restricted.)

SURVIVAL

(Airlines War Training Institute, Wa D. C.)
Survival: Land, Sea, Jungle, Arctic . . ington, D. C. The Infantry Journal, 1

TRAINING

U. S. War Dept.
Military Training Aids. Washingto U. S. Govt. Print. Off. 1944 to date. (Field Manual FM 21-8.) (Restricted.

ABSTRACT

Emergency Food in Arctic Canad

Prefaced by generalities as productivity of different parts Arctic, this publication conta pages of descriptive informati what and where fish, game and life can be found in the arctic a Canada, Greenland and Alask addition, it discusses the metho techniques of securing food and helpful, the habits and habitats tives living in this part of the

Source—*Emergency Food in Canada*—Department of Mines a sources, Mines and Geology Bran tional Museum of Canada; Contribution 45-1 by A. E. P Ottawa, 1945.

"Your Body in Flight"

Copies of the AAF revised edi *Your Body in Flight*, TO No. 30- may be requisitioned through th air inspector in accordance TO No. 00-25-3, or from manding General, Fairfield Air nical Service Command, Pa Field; Attention: Publications tribution Branch, as outlined i Reg. 5-9. Issue to individual will continue as with the o edition.

Correction in No. 8 BULLETI

Attention is invited to a graphical error on page 18, co 1, paragraph 5, line 7, of the AIR SEA RESCUE BULLETIN. The tence should be corrected to "For a loaded raft *witho* drogue . . ."

liography (Continued)

date, number pages, format	Issuing and distributing agency	Content
lbook. ADTIC Bul-944 (Aug.). 108 pp. ½ x 6. Unclassified.	*Obtainable from:* ADT Branch, AFTAC, Orlando, Fla.	Geography, peoples, languages, edible and dangerous plants and animals, and notes on care of personnel.
fare. F. M. 31-20, c.). 87 pp. 4½x7⅝. d.	Published by War Dept., Superintendent of Documents, Government Printing Office, Washington, D. C. *Obtainable* through normal channels used in ordering War Dept. publications.	Basic manual on tactics and care of personnel in jungle areas.
e Jungle—With U. S. fe LC-14-B. Mono-. 3. Ehrsam, Fred-3. 1943. Third edi-1944. 16 pp. Illus. Unclassified.	Published by and *obtainable from:* The Victor Tool Co., Reading, Pa.	Brief notes on how to use a machete for various purposes.
—General Conditions. Nine School Lec-. Revised July 1944. Map Planographed. Unclassified.	*Obtainable from:* ADT Branch, AFTAC, Orlando, Fla.	Instructors' manual for orientation—adaptation, climate, health, natives of South Pacific.
—Survival.—ADTIC ıool Lectures—T-III. ıne 1944. 14 pp. 7 nographed. 8 x 10½. d.	*Obtainable from:* ADT Branch, AFTAC, Orlando, Fla.	Instructors' manual. Principles of tropic living, procedure in case of crash or bailout. Travel, hazards, jungle housekeeping.
e you find it. A guide cy foods of the West-. 1943. First impres-1943; second impres-943. 72 pp. 4¼ x 5¼. d.	Published by order of the Council, Auckland Institute and Museum, Auckland, New Zealand. Printed by New Zealand Newspapers, Ltd., Auckland, New Zealand. *Obtainable from:* New Zealand Air Mission, Washington, D. C.	Pocket guide with descriptions and illustrations of edible and poisonous plants and animals.
Food Plants and Points of the Islands of T. M. 10-420. Mer-D. 1943. (15 April). Figs. $0.15. 4¼ x 6⅝. d.	Published by War Dept., Superintendent of Documents, Government Printing Office, Washington, D. C. *Obtainable* through normal channels used in ordering War Dept. publications.	Scientifically accurate description of plants and how to use them, by recognized authority on the subject.
ıous, and Medicinal Central America. Ammon B., Capt. C. A. Technical Assist-Lindsay, W. R. and ., Canal Zone Experi-dens. 1942 (20 Mar.) llus. Planographed. Unclassified.	Published by The Panama Canal (not to be reproduced except by permission of The Panama Canal). *Obtainable from:* Hq. Sixth Air Force, APO No. 825, c/o P. M., New Orleans, La.	Pocket guide to indigenous plants, with illustrations of each.
oisonous Plants of the Region. NAVMED ren, C. E. and Paul C. 1944. 102 ıs. 5⅛ x 7¼. Un-	Published by Bureau of Medicine and Surgery, U. S. Navy, Washington, D. C. *Obtainable from;* War Dept., Superintendent of Documents, Government Printing Office, Washington, D. C.	Authoritative descriptions and illustrations
Book. Military ımphlet No. 9 (India) tion. MGS M 436 DL 920. Army 6/11/ Britain, 1943 (Sept.) ıs. 6½ x 9⅝. Re-	Published by British Army Staff. *Obtainable from;* Foreign Liaison Section, MIS G-2, WDGS, Washington, D. C.	Tactics, camouflage, booby traps, etc. for fighting in India. Jungle living, uses of bamboo, living off the country and first aid.

(*Next page*)

Restricted Use of Dye Marker Subject of AirPac Bulletin

Because of the effectiveness of fluorescein dye as a sea marking material, it has also been used as a marker for other purposes. An example of this misleading practice is found in a summary of air-sea rescue statistics for April 1945, from NAS, Quonset Point, R. I.: "Rescue PBY dispatched to scene and sighted a dye marker, but secured on report that a TBM and F4U from As-Devlant had dropped them in drill."

While other authorities will probably issue orders concerning this practice, one has already taken action. Commander Air Force, Pacific Fleet, has issued Technical Bulletin 34TB–45 directing that fluorescein dye sea marker shall be used for marking air-sea rescue incidents *only* to preclude the sending of false reports of personnel adrift to rescue facilities.

BuAer has been requested to procure marking materials suitable for use in lieu of fluorescein dye in operations not involving air-sea rescue. Until these alternative materials are obtainable, ComAirPac's 34TB–45 directs that sea dye marker used for other than air-sea rescue purposes be restricted to the following:

1. Bona fide operations against enemy forces where other available marking materials will not provide equivalent effectiveness. Where practicable, all instances of the use of fluorescein dye for this purpose shall be reported to cognizant air-sea rescue activities. (In this connection it may be noted that marker has been and may possibly continue to be used to mark positions where depth charges have been dropped—ED.)

2. Training exercises in areas specifically designated as a result of prior arrangements with air-sea rescue activities. Where the dye is used for this purpose, surface vessels shall always be present in the immediate vicinity.

3. Other prearranged purposes where the employment of fluorescein dye as a sea-marking material offers advantages not provided by any other available marking material and where its use has been approved by the area commander.

Survival Bibliography (Continued)

Title, author, date, number pages, format	Issuing and distributing agency	Content
Out of The Jungle. 1943 (Mar.). 40 pp. Mimeo. Restricted.	Published by Airlines War Training Institute, 1740 G St., NW., Washington, D. C. (Superseded by Item A-1.)	Jungle living, list of necessary items for emergency kit, native foods, health precautions.
Under the Greenwood Tree—or How to Acquire Burmese. R. A. F. (India) n. d. Unclassified.	*Obtainable from:* Foreign Liaison Section, MIS G-2, WDGS, Washington, D. C.	Native customs and living in Burma, with notes on dialects.
The Native Carrier—Employment and treatment of native carriers in New Guinea. 1943 (9 Feb.). 23 pp. 4¼ x 5⅝. Unclassified.	Published by Allied Geographical Section, General Hq. Southwest Pacific Area. *Obtainable from:* Foreign Liaison Section, MIS G-2, WDGS, Washington, D. C.	Employment and treatment of native carriers in New Guinea. Messages, weights and make-up of loads, times and distances, relays, food, clothing, first aid, payment.
You and the Native. Notes for the guidance of members of the forces in their relations with New Guinea natives. 1943 (12 Feb.). 17 pp. 4¼ x 5⅝. Unclassified.	Published by Allied Geographical Section, General Hq. Southwest Pacific Area. *Obtainable from:* Foreign Liaison Section, MIS G-2, WDGS, Washington, D. C.	Rules for conduct toward natives in New Guinea; sign language, hiring and paying labor.
The Pacific World. 1944. 156 pp. 25¢. 5¼ x 7¼ x ⅜. Unclassified.	Published by and *obtainable from:* The Infantry Journal, 1115 17th St. NW., Washington, D. C. Prepared by the New York Zoological Society. Edited by Fairfield Osborn (1944 cloth edition—W. W. Norton and Co., Inc., New York, N. Y.).	History and exploration, climate, ocean currents and ocean life, mammals, plants, peoples of islands of the Pacific.
Pacific Ocean Handbook. Mears, Eliot G. 1944. 192 pp. 54 figs. Map. 3¾ x 6¾ x ⅜. Unclassified.	Published by and *obtainable from:* James Ladd Delkin, Box 55, Stanford University, Calif.	Islands and routes ocean currents, climate, navigation hints, properties of salt water, sea food for the shipwrecked. Conversion tables. Maps.
Poisonous Snakes of Eastern United States—With First Aid Guide. Davis, Harry T., and Brimley, C. S., n. d. 16 pp. 12 figs. 10¢. Unclassified.	Published by and *obtainable from:* North Carolina State Museum, Raleigh, N. C.	Well-illustrated descriptions of local reptiles.
Poisonous and Harmful Fishes. Whitley, G. P. 1943. Unclassified.	Published by and *obtainable from:* Council for Scientific and Industrial Research, 314 Albert St., East Melbourne, Australia.	Southwest Pacific fish illustrated.

Natives Lure Rescue Planes to Island

Almost every plane coming into a Thirteenth Air Force Base reported sighting emergency ground signals coming from an isolated island. Patrol planes recounted yellow marker sheets and life rafts pulled up on the beaches. Mirrors flashed at every passing plane and blinkers twinkled through the night. Listening posts heard SOS signals which failed to stay on the air long enough to be pinpointed. Flares shot across the night sky.

It was discovered after much confusion that the crew of a B-25, which had been forced down in the vicinity of the island from which the mysterious signals were coming, had left their emergency signaling equipment behind.

A party was sent to the island and found the natives having a holiday with flares, rockets, mirrors and the Gibson Girl. They also were reluctant to relinquish the equipment. "We need," their chief insisted. "We try make fliers come down here so we can trade carved wood and sea shells!" (AIR FORCE, May 1945.)

Drill and Training Teach Air Ditch and Live (Continued

the men are made to realize tha is little time in such an emerge thought; doing the *right* thing minimum of wasted effort an should be almost a reflex action.

Equipment is loaded into the p hull, the men assume their p and the plane starts down the into the water. Through the h the hull, the water enters and to rise inside. When the water r above the catwalk and starts s around the legs of the pilot, h the abandon ship signal and start to happen. Emergency g collected, water-tight doors are sl shut and from the waist blister raft is broken out and i Swiftly the crew piles into th and paddles away from the s plane.

The average time for these usually requires about 70 secon a time record of 45 seconds was lished by one crew. Competit stop watch among the 12 crew prising a class helps create i and excitement in the drill.

The training is aimed to a crews with all the dangers invol ditching or forced landings, p them for any emergency, and sti their safety consciousness to the that survival rather than deat follow a forced landing.

Corner Reflector Scores Official Rescue

In the first authenticated res its kind reported, the MX-138/ ner reflector helped save the live men. These men, who had c their B-29 in the Pacific off the anas because of lack of fuel, ere reflector in one of their two A- tiple rafts.

Help came in the form of a which picked up the "blip" on its scope at a distance of 10 miles flying at 800-1,000 feet altitude PBM directed a seaplane tender rafts. The tender reported it ha picked up the indication of the reflector at a range of 5 miles.

As reflectors for one-man rafts 137/A) and multi-place rafts gain distribution in the fleet, it is ex that they will assist in more anc rescues.

NAVAL AVIATION NEWS—1 June

ilm Strips Relative to Air-Sea Rescue e for Screening at Air Sea Rescue Agency

l list of film strips on subjects relative to air-sea rescue which are on file at the Air Sea library is compiled and published for information and reference. Film strips may Agency but cannot be loaned for screening elsewhere. None is classified higher .

FILM STRIPS AND SUBJECTS

Title	Subject	Released	Running time (frames or minutes)
AF Emergency Rescue Boats. Boats Nomenclature.	Gives correct nomenclature for main parts, equipment, fittings, rigging and stations of AAF emergency rescue boats. Describes fire stations and general quarters.	1944	29 (fr.)
AF Emergency Rescue Boats. Construction Principles and Emergency Repair of Small Boats.	Describes principles of construction and methods of effecting emergency repairs on small boats. Shows how to construct rescue boat hulls and methods of making emergency repairs at sea.	1944	42 (fr.)
AF Emergency Rescue Boats. Docking Procedure.	Illustrates procedures and precautions for AAF rescue boats when entering, leaving, and docking in harbors.	1944	28 (fr.)
AF Emergency Rescue Boats. Electrical System in 85-foot Boat.	Presents operation and routine maintenance of 110 volt D. C. electrical system on 85-foot AAF rescue boat. Describes pre-starting check and circuits of 110 volt D. C. system.	1944	55 (fr.)
AF Emergency Rescue Boats. Electrical System of 63-Foot Boat.	Describes location and operation of various units of electrical system of 63-foot AAF rescue boat.	1944	48 (fr.)
AF Emergency Rescue Boats. Engine Starting and Operating Process of 85-Foot Boat.	Illustrates correct procedure for starting, operating, and stopping auxiliary engine on 85-foot AAF rescue boat.	1944	64 (fr.)
AF Emergency Rescue Boat. Engine Starting and Operating Process of 63-Foot Boat.	Describes correct procedure for starting, stopping, and operating. Hall Scott Defender 12-cylinder Marine engine in 63-foot rescue boat.	1944	53 (fr.)
AF Emergency Rescue Boats. Fire Fighting.	Shows equipment and procedure used in fighting fire aboard AAF emergency rescue boats at sea and methods of protecting personnel when making rescues.	1944	41 (fr.)
AF Emergency Rescue Boats. Hermetic Combustion Heaters.	Presents operation and control of Stewart Warner Hermetic combustion heater used on 85- and 63-foot emergency rescue boats.	1944	51 (fr.)
AF Emergency Rescue Boats. International Code of Signals.	Explains international code of signals, how flag signaling system makes use of 40 flags. Describes use of flag "hoists" and reading of code flag and numerals.	1944	59 (fr.)
AF Emergency Rescue Boat. Personal Safety Aboard Ship.	Gives principles of personal safety to be followed by AAF. Emergency boat crews.	1944	47 (fr.)
AF Emergency Rescue Boats. Semaphore Signaling.	Describes semaphore system of hand signaling.	1944	40 (fr.)

s at end of table.

(*Next page*)

Three Publications Aid in Equipment Field

The three publications reviewed below collectively represent a composite of the most current information on equipment available for distribution. Individually they are products of the Army, Navy, and Air Sea Rescue Agency, putting into the hands of equipment officers a descriptive list and pertinent data on personal and protective equipment for rescue and survival. They do not duplicate each other's efforts—but are complementary and together provide a well-rounded composite of much needed and useful information.

Air-Sea Rescue Equipment Guide

Published by the Air Sea Rescue Agency, with cognizance of the United States Army and Navy and other interested services of the United States and allied governments, this is a technical guide designed to fulfill a long and established need of equipment and survival officers of the several services for complete and accurate information with regard to the *availability* of items which have been primarily designed for air-sea rescue. .

This publication deals with each individual item of air-sea rescue equipment as used by both the United States Navy, Bureau of Aeronautics, and the United States Army Air Forces. The aviation equipment and survival officers of the Navy and the personal equipment officers of the AAF are now able to find in a single source complete data on any available item of air-sea rescue equipment. In addition to the fact that any item carried in the *Guide* is available, its most important feature is that complete descriptions of equipment items are included. Illustrations are used where applicable.

The *Guide* also includes a compilation of pyrotechnic equipment of the United States and allied countries adaptable to air-sea rescue and survival, supplying information on aircraft parachute flares, fuses, markers, signals, float lights, smoke grenades, and pyrotechnic pistols and projectors. This pyrotechnic information is published for the convenience of those engaged in this field.

(*Next page*)

Film Strips (Continued)

No.[1]	Title	Subject	Released	Running time (frames or minutes)
FS1-1048	AAF Emergency Rescue Boats. Types of AAF Rescue Boats.	Gives equipment and dimensions of 45-, 63-, 85-, and 104-foot AAF rescue boats.	1944	36 (fr.)
FS1-1058	AAF Emergency Rescue Boats. Electrical System in 63-Foot Boat.	Describes sources of power, electrical operation, and uses of auxiliary battery charging system aboard 63-foot AAF emergency rescue boat.	1944	48 (fr.)
FS1-89 SA-2444f	Aerial Navigation—Dead Reckoning Problems Patrol and Search.	Defines search mission, and sets forth responsibility of navigator. Defines terms, and describes factors affecting methods of search, and common patrol patterns.	1942	28 (fr.)
FS1-459	B-17 Airplane—Inspection and Maintenance of A-2 Life Raft.	Describes inspection and maintenance of A-2 life raft used on B-17 airplane, including six-month inspection, inflation test, and packing life raft in airplane.	(*)	46 (fr.)
SN-2306b	Coconut as Food and Drink	Describes various dishes prepared from green, mature and sprouting nuts of coconut palm. Demonstrates ways of preparing coconuts as food and drink.	1944	75 (fr.) 8 (min.)
SN-2306d	Castaway—Identification of South Pacific Plants.	Illustrates and describes natural habitat, means of identification, and method of preparing important prepared food plants: coconut, papaya, pandanus, banana and plantain, taro, breadfruit, bamboo, wild hibiscus, citrus fruits, mango, beech almond, and vines.	1944	88 (fr.)
SN-2306c	Castaway—Making Useful Articles from Coconut Material.	Explains many ways in which coconut tree may be useful to a castaway. Shows how fronds are used in making shelters, weaving baskets, eye shades, platters, and fishing hampers. Demonstrates method of making shoes from coconut husks and rope for fishing lines and lashings.	1944	88 (fr.) 12 (min.)
FS1-623	Ditching the B-24	Illustrates procedure for crew members of B-24 airplane to follow in ditching.	1944	44 (fr.)
SN-928a	Emergency Equipment for Seaplanes—Part I.	Describes emergency equipment carried in seaplanes and how it is used.	1942	40 (fr.)
SN-928b	Emergency Equipment for Seaplanes—Part II.	Describes these items of emergency equipment as carried in seaplanes and how they are used.	1942	41 (fr.)
SG-2624 SCG-152c-j	Emergency Identification Signal.	Demonstrates emergency identification signal and its construction. Illustrates how it works and how to use it.	(*)	20 (fr.)
FS1-564	Emergency Signal Mirrors in Air Rescue.	Presents the tempered steel emergency signal mirror, and its use when forced down.	(*)	30 (fr.)
SG-2569 SCG-152d-j	Flare Signals	Demonstrates hand signal, plunger type hand signal, and pistol type flare signal, and diagrams of their respective construction. International flare—signal kit and its assembly are also shown.	(*)	46 (fr.)
FS1-563	Handling and Release of Pigeons by Air Crew.	Importance of homing pigeons in air-sea rescue of bomber crews; methods of handling and releasing pigeons by air crew members.	1943	33 (fr.)

See footnotes at end of table.

(*Next page*)

Equipment Publications (Continued)

In order that the informati tained may be kept current and of the rapid changes in this equipment, the publication is is loose leaf form and "spot" or ter supplements are constantly be seminated to holders of the *Guid* form of page facsimiles. These ments contain information on cl availability, modification, or ment to equipment items and are graphed and distributed as qu possible. As soon as practicab ever, the temporary supplements replaced by permanent printed p loose leaf form.

Material compiled within the *Rescue Equipment Guide* ha checked with official sources ar complete and up-to-date as can termined in a field where new ments are constantly being m is alphabetically indexed.

Source: AIR-SEA RESCUE EQU GUIDE. Published by U. S. Coas for the Air Sea Rescue Agency ington D. C., 1945 (*RESTRICT*

Manual for Aviation E ment and Survival Offi

This informative manual w lished primarily for squadron but will be useful also to CA HEDRON men. In the introduc duties of the aviation equipm survival officer, as defined in A Circular Letter No. 17-44 (d March, 1944) are discussed. Th ual does not attempt to tell the how to perform his duties, but it provides a general outline of introduces him to the equipm which he is responsible, and—n portant—guides him to sources nical information.

The first section of the man scribes the equipment over wh AESO must supervise the instru (1) maintenance personnel in servicing, and (2) flight perso the proper use. Equipment desc the very latest, although older mentioned since it may be foun field. Chapters on oxygen equ life vests, life rafts, emergency l containers, droppable rescue gear belts and harness, and parachu included with as much discus use and maintenance as can be s in nontechnical fashion.

(Ne

Continued)

Title	Subject	Released	Running time (frames or minutes)
ndividual Cooking — The Arctic.	Method of identifying and preparing arctic greens, roots, and berries; ways of trapping, killing, and preparing wild animals.	1944	56 (fr.)
ndividual Cooking—The Jungle.	Instructions on how to prepare wild jungle plants, catching fish, snaring game, and purifying water in an emergency.	1944	51 (fr.)
Lifeboat Davits	Shows the operation of the gravity, radical, or round bar and quadrantal types of lifeboat davits.	1943	68 (fr.)
Lifeboat Equipment	Shows how to stow wartime required equipment aboard a standard 30-foot pulling lifeboat. Proper use of some of the equipment is explained.	1943	54 (fr.)
The Rocket	Shows the make-up of a rocket signal, its use and how to operate it safely and successfully.	(*)	19 (fr.)
Theatres of War—Pacific Area—Caroline, Marianas, and Bonin Islands.	Explains military value, climate and atolls surrounding the islands, and food, clothing, temperament and religion of inhabitants, dealing primarily with larger islands of Kusacie, Ponape, Truk, Yap, Palau, Saipan, Guam, Rota, and Hahajima.	1943	87 (fr.) 15 (min.)
Theatres of War—Pacific Area—Marshall, Gilbert and Ellice Islands.	Traces history of each of the island groups, prevailing wind and ocean currents, what food is available and the characteristics of Polynesian and Malaynesian inhabitants.	1943	67 (fr). 12½ (min.)
Theatres of War—Pacific Area—Netherlands East Indies—Lesser Sunda Islands.	Explains living conditions of natives and how to treat them to obtain their help; shows size and climate of Timor, Flores, Soemba, Soembawa, Lombok, and Bali which compose the Lesser Sunda Islands.	1943	92 (fr.) 15 (min.)
Theatres of War—Pacific Area—The Jap, his Home Field.	A teacher who taught in Japan tells of size, weather conditions, and topography of Japan. States Japs are thrifty, hard working. Describes country life, city pattern, industry, and Jap way of life.	1944	96 (fr.) 20 (min.)
Theatres of War—Pacific Area—The Jap, his more Honorable Neighbors.	How to recognize and identify Japanese, Northern and Southern Chinese, Ainus, Koreans, Formosans, Russians and Giliak Indians. Describes size, clothes, headgear, uniforms, customs, houses, transportation, methods, religious symbols of each.	1944	91 (fr.) 24 (min.)
Theatres of War—Pacific Area—The Jap, his Honorable Self.	Describes Taru, the Japanese boy, and what makes him tick. Shows the traditions, customs, civic duties, school, army, physical training, character, and psychology from babyhood to manhood. Gives caution and advice on how to "out-Jap" the Jap.	1944	69 (fr.) 13 (min.)

tes at end of table.

(*Next page*)

Equipment Publications (*Continued*)

This manual shows the varied duties of the AESO, and stresses the importance of cooperation with other officers of the squadron command. Also, because of the varied equipment needed by a combat flying unit, the manual points out that duties of supplying and instructing the personnel in the proper use of this equipment may be general or specialized, depending on the size of the unit. An AESO may be designated as a parachute officer, a safety officer, a material officer, an equipment and supply officer, or he may have the duties of all of these, should the unit be a small one.

The second section, the supplement, is a collection of all the technical orders and notes, *sense* manuals, training films, and other publications to which reference is made in the text. This section is indexed, as well as divided and tabbed under the same headings as the chapters of the text for quick, easy reference.

This manual is loose-leaf and although additions and corrections will be issued as equipment and practice are changed, the officer using the book is expected to keep the supplement section up to date by adding new publications and discarding those which are cancelled or superseded.

Source: MANUAL FOR AVIATION EQUIPMENT *and* SURVIVAL OFFICERS. Aviation Training Division, Office of the Chief of Naval Operations U. S. Navy. NAVAER 00-80V-36. OPNAV 33-NY-34. (*RESTRICTED.*)

Reference Manual for Personal Equipment Officers

A detailed, comprehensive reference book, this manual is intended to aid personal equipment officers in: supervising the inspection, operation and maintenance of all personal and protective equipment; in instructing air crews in the proper use of all such equipment. Its purpose is expressed in the foreword which states in part: "This compilation of material has been prepared for use of personal equipment officers during their period of instruction at the Army Air Forces School of Applied Tactics. It will prove useful in addition for purposes of reference in the field."

The manual contains information on the principles of flight, and the performance and servicing of oxygen equipment in combating the physiological reaction to high altitude flights. A chapter on

(*Next page*)

Film Strips (Continued)

No. [1]	Title	Subject	Released	Running time (frames or minutes)
SN-1538a	Theatres of War, Pacific Area—Melanesia.	Discusses war in South Pacific and shows strategic importance of Melanesia. Describes terrain and characteristics of natives of New Caledonia, New Hebrides, Solomon Island, and Bismarck Archipelago.	1943	81 (fr.) 19 (min.)
SN-1538g	Theatres of War—Pacific Area—Netherlands East Indies, Borneo and Celebes.	Deals with geographical features of Borneo and Celebes, and monsoon periods, available game, dangers, hardships. Stresses necessity of avoiding Jap patrols and advantages of befriending natives.	1944	91 (fr.)
SN-1538n	Theatres of War—Pacific Area—Netherlands East Indies—Java.	Explains living conditions, temperament, superstitions, clothing of Javanese natives, how to obtain their help, size and population of large cities, effects of Dutch colonization, means of dealing with Malays.	1943	90 (fr.) 15 (min.)
SN-1538p	Theatres of War—Pacific Area—Netherlands East Indies—Molucca Islands.	States that Malays, Papuans, and Chinese populate Molucca; a native describes the terrain and winds. Explains how personnel marooned on one of the islands can, with the aid of natives, escape to a friendly base.	1944	88 (fr.) 16½ (min.)
SN-1538o	Theatres of War—Pacific Area—Netherlands East Indies—Sumatra.	States aerologic and climatic characteristics of the island and gives existing conditions and how to make the best of them. Describes characteristics of natives.	1943	97 (fr.) 15 (min.)
SN-1538 1	Theatres of War—South Pacific—Survival in the South Pacific.	Gives useful hints on how to obtain water, food, build a fire, construct shelter, and protect yourself if forced down on an island. Tips for getting along with natives are also given.	1943	80 (fr.) 16 (min.)
SG-2537	Very Pistol	Shows parts of Very's Pistol and cartridge, methods of firing and means of identifying cartridges at night.	(*)	22 (fr.)

*Information not available.

[1] **Army Designation:**
FS Film Strip.
Navy Designation:
1st Letter:
S Film.
2d Letter:
A—Army.
C—Commercial film deemed suitable for Navy training.
G—Coast Guard.
N—Made expressly for Navy training.
United Nations Central Training Film Committee:
SCG U. S. Coast Guard.

ADDITIONAL TYPES OF EQUIPMENT RECEIVED FOR EXHIBIT

(2 April to 31 May 1945)

Catalogue No.	Object	Source
45.22.1–98	Equipment for one Metal Life Raft, No. RA271.	Property Officer USCG, Curtis Bay, Md.
45.23.1	Blanket bag, waterproof	Allen Mfg. Co., New York City.
45.24.1–90	Lindholme Rescue Dinghy Apparatus, consisting of 5 containers.	USCG Warehouse, 345 Warren Street, Jersey City, N. J.

Equipment Publication (Continued)

survival equipment and proced
cusses the PEO's responsibi
knowing the area in which the
is operating, and passing on
nent information and equipme
sary for proper performance
nance kits, life rafts, and
equipment are described and re
dations are made for the sto
such equipment aboard various
aircraft. The importance of p
ing clothing, goggles, and armo
tection from low temperature,
enemy fire is stressed. Care a
tenance of parachutes, and p
technique during bail-out are
in detail, and ditching, radio a
procedures are outlined. A ch
first aid gives instructions for
air crews in emergency treat
combat injuries. Films to be
supplementary training aids a
and examples of the reports th
would be required to submit ar

In the appendix all AAF re
and technical orders pertainin
duties of the PEO are listed b
and subject. A partial stock
PEOs is also included in this
The manual is both indexed a
trated.

The *reference manual for equipment officers* was evolved
mimeographed manuals that
leased in April and June of 1944
latest edition supplied additio
mation on land survival and e
communication procedures.

Source: REFERENCE MANUAL SONAL EQUIPMENT OFFICERS (fo
tional use only). Compiled a
by Aero Medical Department,
Forces School of Applied Tacti
tember, 1944. (*RESTRICTE*

BAILING-OUT AD

How not to bail out was gr
described by a B–17 pilot retu
report from an Air Intelligence
Unit at an AAF redistributio
in the United States. The p
of seeing eight men lose their
attempting to jump from a
bomber. As each stepped out h
hand on his ripcord, and cons
each chute opened so quickly
caught fire from the aircraft.
emphasized that a premature
is a virtual certainty if a jump
from a burning plane with a
the ripcord. (AIR SURGEON'S BU

ERGENCY USES OF THE PARACHUTE

'ts have come back from
led out over wild territory
r parachutes in a hundred
's. These improvisations
lected in a new illustrated
anual, No. 60–1, entitled
ses of the Parachute. One
ed on hearing the title,
there was any other use
"

he 3⅛ inch by 4¼ inch
s the following Foreword:
l has been published to
ıy Air Forces flying per-
ried and proved ways of
ıchute in emergency situa-
the parachute should be
e from it can be made
shelters, clothing, packs, signals, hunting and fishing implements, first-aid materials, and other important survival aids. The basis of issue of this manual is one per parachute, to be packed with the parachute Log Record, AAF Form 46.

"The procedures described herein were developed and tested by the Arctic, Desert and Tropic Branch, AAF Tactical Center, Orlando, Fla., in collaboration with the AAF Arctic Training School, Buckley Field, Col. Comments and suggestions for possible future revision of this manual are desired by the ADT Branch, AFTAC."

Requests for additional copies should be addressed to the Publications Distribution Branch, Air Technical Service Command, Wright Field, Dayton, Ohio.

About 45 emergency devices are illustrated by descriptive drawings, cutaways, or diagrams to show that every part of the parachute assembly can be utilized: silk, pack and harness, shroud lines, ripcord and metal fittings.

Two travel packs are illustrated. (Not reproduced on the following pages.) The first, a light knapsack made from the parachute seat pack, requires no sewing, but merely the cutting off of unnecessary parts. The second, a heavy duty pack strap with tumpline, requires about 4 feet of single-thickness harness webbing, 1 foot of double thickness webbing, and some judicious hitching together.

In the clothing section can be found recipes for cooking up puttees and sandals from chute cloth, mukluk boots from cloth and half of a canvas cushion cover, various headdresses to protect against sun, sand and dust, an improvised eye shield, a shade hat made from the chute apex and the metal frame and canvas cover of the pack, handkerchiefs, scarfs, wristlets, etc.

The color and size of the white chute for personnel are in themselves good qualities for signals against dark backgrounds. The chute can be stretched over the ground, bushes, and across a small stream; or it can be cut into small banners or trail markers.

Several shelters are depicted. A two-page center spread provides explicit directions for constructing an 11-pole paratepee, useful in either hot or cold climates and, with a fire burning inside, as a signal at night. Modifications of this, the single-pole paratepee and the rope-sustained model, are also presented. A three-pole paratent and a three-man, pole-frame lean-to are extremely simple to construct with the complete parachute, folded double. Likewise easy to improvise is a parafly slung over a taut line between two trees and held tight by tie-poles lashed to stakes. A snug sleeping bag results from clever folding of the chute cloth.

Devices for hunting and fishing range from a slingshot made of packframe wire, elastic cord from the pack and harness webbing, to a two-man fishing seine made of the entire chute folded, cut, tied, spread with floaters and weights, and maneuvered by hand poles.

(*Next page*)

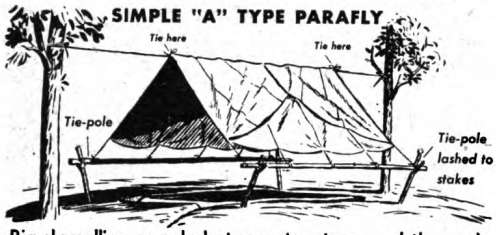
Parachute (Continued)

A litter improvised from poles, spreader sticks and chute cloth about three panels wide, is easily assembled. An arm splint fashioned from the chest-pack frame bound with chute cloth is shown. Bandages of various tourniquet, and an arm sling

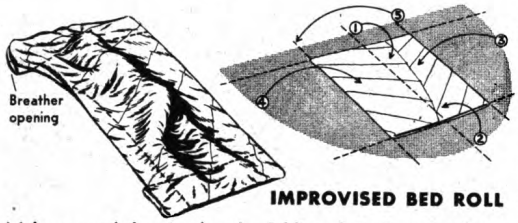
(A

SHELTER

SIMPLE "A" TYPE PARAFLY



Rig shroudline or pole between two trees and throw chute over it. Fold back edges until fly is about 4 panels wide. Lash chute to tie poles with shroudlines. Build parafly high enough so beds can be raised off ground.



IMPROVISED BED ROLL

Make a good sleeping bag by folding chute, in order shown by numbers, to rectangle approximately 8 x 7 feet. Full chute or as few as 10 sections may be used. Make final fold (5) down center, book-fashion. Then fold side and lower edge under. Crawl in through top; tuck top under; leave opening at corner.

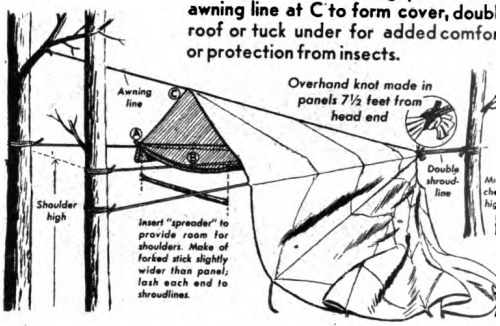
SHELTER

SINGLE POLE PARATEPE

This emergency chute shelter c be put up quickly. Use 14 pan (or less) of chute, and tie to 7 foot pole in same manner us for Pole Paratepee Tie Pole. L in fork of tree. Stake down skirt form 12-foot circle. Rope can b substituted for pole; tie arou apex of chute, throw rope ov tree branch and secure at prop height.

PARAHAMMOCK

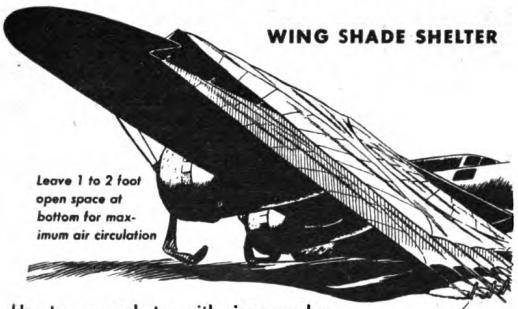
Use 4 to 7 panels. Fold first tw panels together and tie at A to for bed B. Throw remaining panels ov awning line at C to form cover, doub roof or tuck under for added comfo or protection from insects.



SHELTER

SHADE SHELTERS FOR HOT AREAS

WING SHADE SHELTER



Use two parachutes with air space between to reduce temperature. Attach top chute over top aileron; fasten bottom chute from underside of aileron.

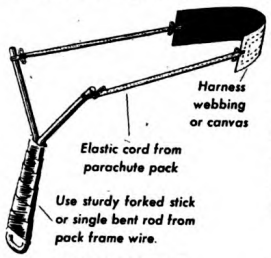
Use airplane tubing, rocks or wood stakes to secure chutes

SIMPLE SHADE SHELTER

Make shade shelter of chute cloth as illustrated. Use two layers of cloth separated by an air space of about 12-20 inches. In hot desert areas–scoop down into sand–it will be cooler.

HUNTING & FISHING

IMPROVISED SLINGSHOT



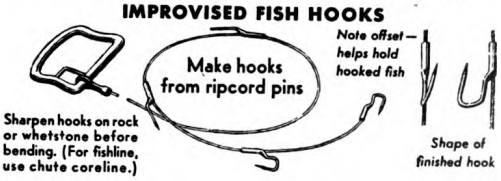
A simple slingshot can b made from parts of th chute pack. With practice small animals, such as bird rabbits and squirrels, ca be killed.

WIRE SNARE

Use single wire strand from rip-cord. Arrange in animal trails.

SEAL HUNTING SHIEL

IMPROVISED FISH HOOKS



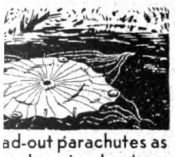
tinued)
he first-aid section.
f miscellaneous items in-cludes a sea anchor, made of the metal frame from the seat or back pad and chute cloth; a raft sail using chute cloth and oars as mast and cross yard; and a raft awning for protection

(Next page)

SIGNALS

nal banners or flags
loth. Fasten to poles
poles to tree tops.

Spread parachute out over low trees or bush tops. Secure ends by tieing down with shroudlines.



ad-out parachutes as
narkers in clearings.

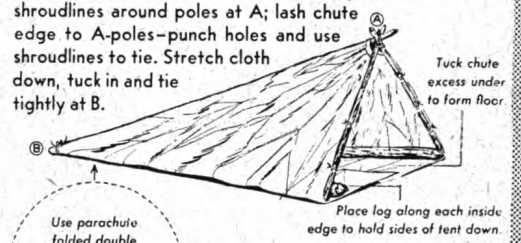
Use small pieces of chute cloth to mark or "blaze" trails.

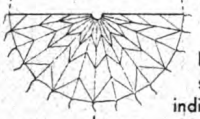
y wooded country, stretch parachute across a stream.

SHELTER

3-POLE PARATENT

Lash a 13-foot ridgepole to apex of tied frame made of 8-foot long A-poles. Tie chute apex shroudlines around poles at A; lash chute edge to A-poles–punch holes and use shroudlines to tie. Stretch cloth down, tuck in and tie tightly at B.

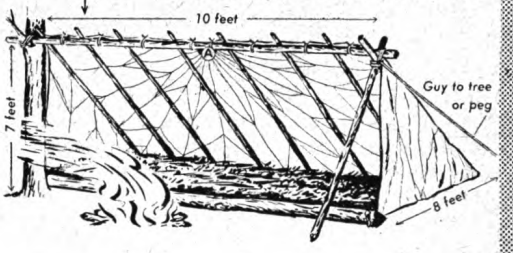




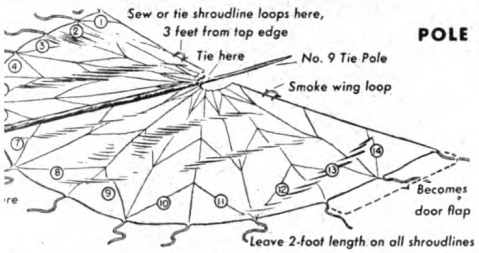
Arrange shelter openings crosswise to wind

3-MAN LEAN-TO

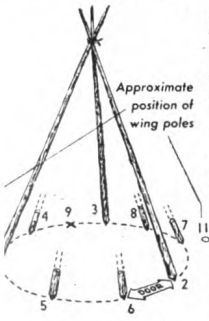
Build pole framework of approximate size shown. Cover with chute and tie as indicated. Apex of chute is lashed at A.



IELTER



ADAPTING THE CANOPY: Cut 14 panel sections from opy; remove pilot chute and apex. Cut off all apex shroud-s except 16" of lines on panels No. 6 and No. 7–these are l to Tie Pole (No. 9).



2 ERECTING POLE FRAME: Poles should be about 14 feet long, straight and smooth. Tie poles 1, 2 and 3 together in a tripod–distance from tieing point to base of poles is same as length of chute panel. Place poles 4, 5, 6, 7 and 8 loosely against tripod to form temporary 12-foot circle. Place Tie Pole (No. 9) which is attached to chute at panel No. 6 (see 1) in proper position opposite door. Wing poles are numbered 10 and 11.

POLE PARATEPEE

4 COMPLETED PARATEPEE: The Paratepee is one of the best of emergency shelters, especially in cold areas. It sleeps 3 men comfortably and will accommodate more. Fire can be built inside for warmth, cooking and drying of clothes. Makes a prominent "marker" signal on the ground; fire inside makes the Paratepee look like a beacon at night.

SHELTER

3 APPLYING CANOPY TO FRAME: Starting from Tie Pole (No. 9) to which canopy is tied, bring each outer edge of chute around framework toward door. Tie shroudline of panel No. 1 temporarily to No. 12 panel line. (Panels 13 and 14 form door overlay.) Push all poles outward until chute covering is tight. Then stake down bottom with pegs. In cold areas, stake cloth down to ground; in warm areas leave air space at bottom.

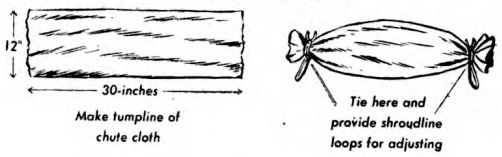
Parachute (Continued)

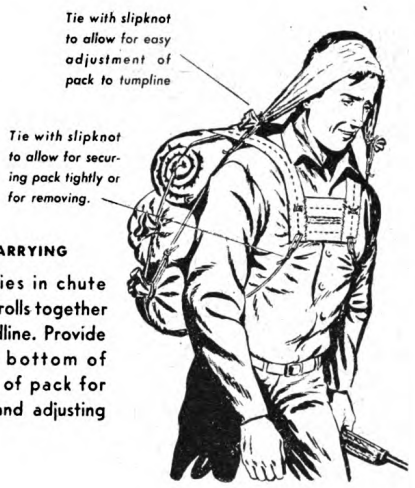
against wind and cold in northern sea areas, and against sunburn and loss of body moisture in warm oceans. Other uses are: snowshoes improvised from saplings and a webbing of shroud lines; a life preserver made from th rubber seat cushion; the ru

(N

TRAVEL PACKS

MAKING TUMPLINE





FOR CARRYING

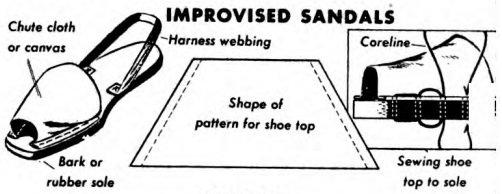
Roll supplies in chute cloth. Bind rolls together with shroudline. Provide a loop at bottom of each side of pack for attaching and adjusting tumpline.

CLOTHING

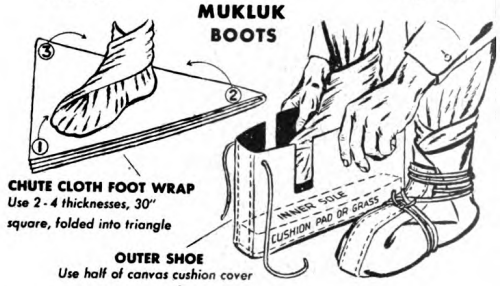
PUTTEES

Make from chute cloth, webbin or canvas. Wind strips spirally overlapping shoe top and pant leg. Puttees help keep sand an snow out of shoes and protec legs against bites and scratches

IMPROVISED SANDALS

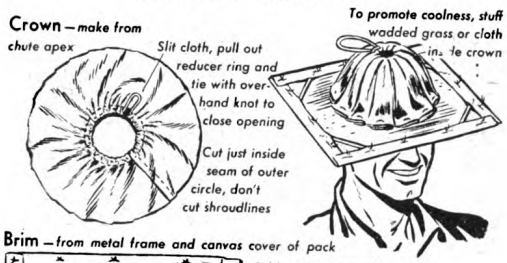


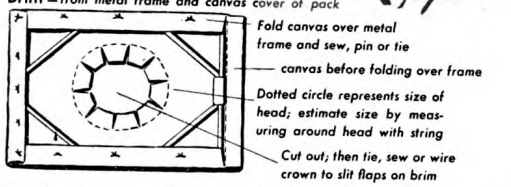
MUKLUK BOOTS



CLOTHING

IMPROVISED SHADE HAT





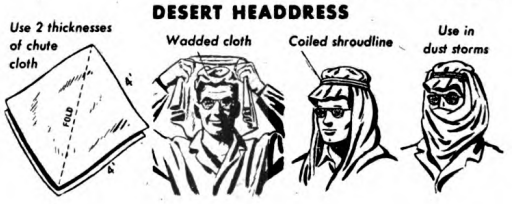
WRISTLETS: For protection against cold or insect bites. Wind strips of chute cloth over wrists, overlapping gloves and sleeves.

HANDKERCHIEFS, SCARFS: Cut or rip sections of chute cloth to make handkerchiefs, scarfs, foot wrappings, improvised loincloths, etc.

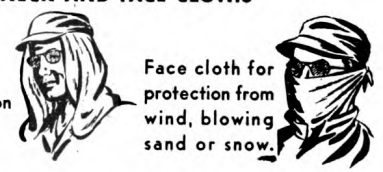
TIPS FOR SEWING: For tough thread, use strands inside core of shroudline. Improvise needle from hook of elastic chute pack cord (p.24), from sliver of hard wood, bone or ration can opener.

CLOTHING

DESERT HEADDRESS



NECK AND FACE CLOTHS



Neck cloth for protection from sun.

Face cloth for protection from wind, blowing sand or snow.

IMPROVISED EYE SHIELD

For protection against sun glare and snowblindness.

Use the round elastic cord from chute pack. Fasten metal hooks through slits in cloth.

Cut or rip ⅛-inch eye slits. Fray the edges to reduce glare.

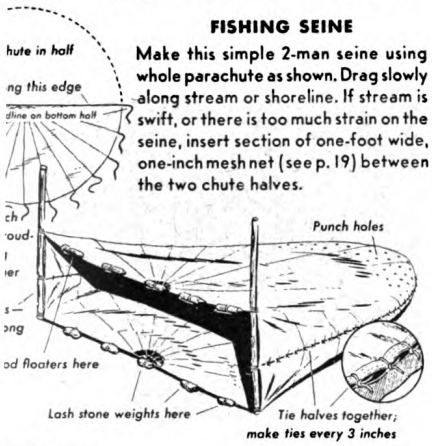
Make the shield of webbing or 2½-inch wide strip of canvas, or black felt on rubber seat cushion. Blacken canvas or webbing with soot to reduce glare.

inued)
ion burned as a daytime
kjack made from metal harness fittings and webbing; bundles made from chute cloth and core lines; cloth for map parchment as a record of travel; and a sewing needle made by straightening and sharpening the hook

(Next page)

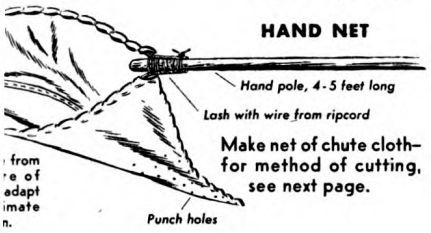
HUNTING & FISHING

FISHING SEINE



Make this simple 2-man seine using whole parachute as shown. Drag slowly along stream or shoreline. If stream is swift, or there is too much strain on the seine, insert section of one-foot wide, one-inch mesh net (see p. 19) between the two chute halves.

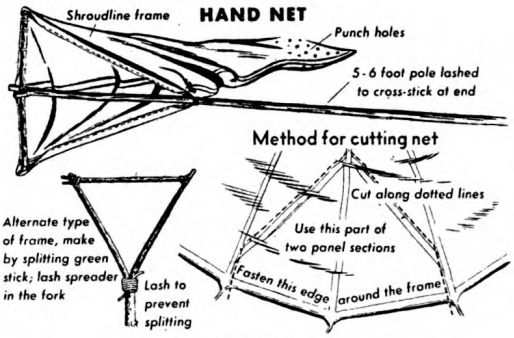
HAND NET



Make net of chute cloth—for method of cutting, see next page.

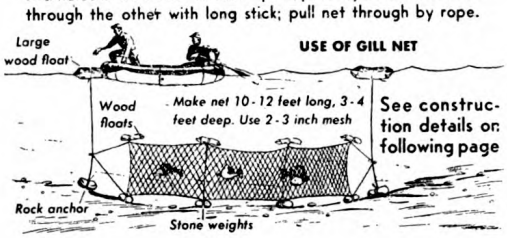
HUNTING & FISHING

HAND NET



GILL NET MADE OF CORELINE

The gill net is often the most effective means for catching fish. Fish are caught when they head into net. Place net across stream or set in water at any depth. Can be used under ice by cutting two holes in ice about 10 feet apart; pass rope from one hole through the other with long stick; pull net through by rope.



See construction details on following page

HUNTING & FISHING

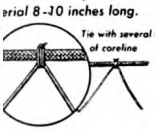
CONSTRUCTION OF GILL NET

SPACER

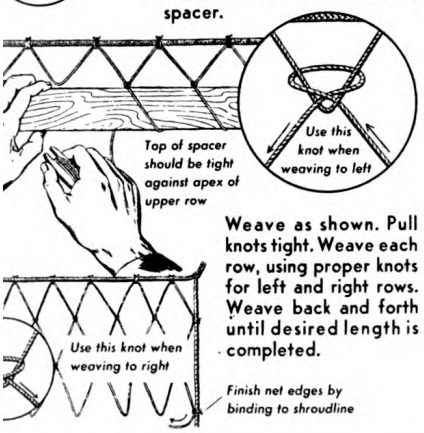
ls size of mesh; mesh size will
ie width of spacer. Make of
erial 8-10 inches long.

NEEDLE

Make from wood, bone or tin in shape shown. Can be 2-3 inches long, ½ to ¾ inch wide. Wind coreline strand around needle; add strands by tieing.



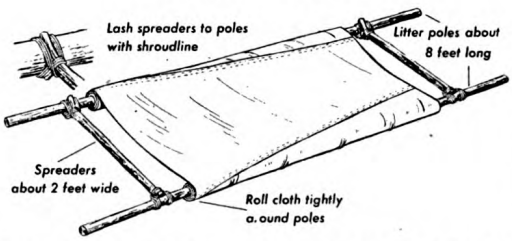
Begin weaving on stick, tautly stretched shroudline or rope. Tie first line of mesh as shown, using spacer.



Weave as shown. Pull knots tight. Weave each row, using proper knots for left and right rows. Weave back and forth until desired length is completed.

FIRST AID

IMPROVISED LITTER



Improvise simple litter from rectangle of chute cloth, about 3 panels wide and 6 feet long. Roll cloth tightly on stout poles to proper width. Insert and lash spreaders to poles to make a rigid assembly.

ARM SPLINT

For simple fractures not requiring traction, splints can be made of chest pack frame bound with chute cloth. Pad the frame well. Use chute cloth to pad and bandage any type of improvised splint. Adapt wire of pack frame to make proper splints.

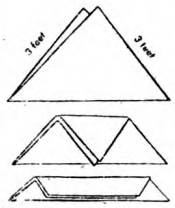
Parachute (Continued)

of the chute pack's elastic cord.

A vigorous publicity campaign is in progress to make fliers aware of the survival aid's existence, with the objective of proving to any flier that wherever he is forced down, and no matter h equipment he has, the parachut immeasurably to survival.

FIRST AID

BANDAGES OF CHUTE CLOTH



- 4" by 4 yds. for thigh, groin, trunk
- 3" by 4 yds. for extremities
- 2" by 4 yds. for hands, toes, head

TRIANGULAR BANDAGES
Use for dressing of wounds, fractures, and for slings.

SOME BANDAGE USES

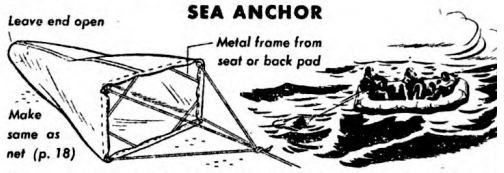
TOURNIQUET

SLING

OTHER USES: Make compresses of triangular bandages, pieces of sponge rubber from seat or back pads, or folded canvas. Use to stop bleeding by pressure method; use for padding splints, etc.

MISCELLANEOUS

SEA ANCHOR



When ocean currents are moving toward destination, but win is unfavorable, put out sea anchor. In rough seas, rig sea ancho to bow of raft; keep sea anchor line long so that when raft is a crest of wave, sea anchor stays in trough of wave.

RAFT SAIL

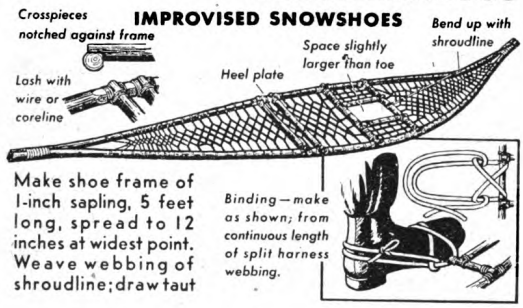
Make an improvised square sa of chute cloth; use oars wit their extensions as mast an crossbar. Secure one corner o lower edge to raft; hold lin attached to other corner.

RAFT AWNING

Rig awning to provide warmth i cold areas and to reduce thirs and prevent sunburn in warn areas. Leave ventilation a sides in warm areas; in col bring edges down to sides.

MISCELLANEOUS

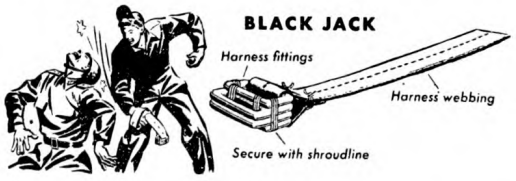
IMPROVISED SNOWSHOES



SPONGE RUBBER SEAT CUSHION
Use as life preserver or use pieces for insoles, splint padding, axe sheath, etc.

RUBBERIZED HORSE-HAIR CUSHION
Burns readily with dense black smoke. Makes a good daytime signal.

BLACK JACK

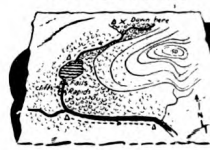


MISCELLANEOUS

USE CHUTE CLOTH FOR PACKAGES

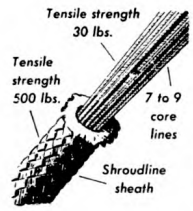
Pack food and small articles in bags made of chute cloth. Wrap bags together in large piece of chute cloth for easier packing.

SKETCH MAPS



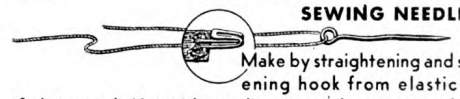
Map course of travel chute cloth. Withstan wear and wetness.

FACTS ABOUT SHROUDLINES



Each chute will provide 24 shroudline each about 14 feet long (total of 3 feet). There are 7 to 9 corelines each shroudline; each coreline pu out separately. Use shroudlines f lashing and tieing, for lifelines, et Use corelines also for sewing, wea ing, tieing and for fishlines.

SEWING NEEDLE



Make by straightening and sharp ening hook from elastic cor of chute pack. Use with coreline to sew loose-weave fabric

CHUTE SILK FOR BARTER: Chute silk is valued by natives i remote areas all over the world. Trade squares of silk for foo and help–but do your trading economically–don't waste clot

for

nal Equipment Officers"

y Personal Equipment Laboratory, Engineering Division, Air Technical Service Command, Wright Field, Ohio

otes" editions are a regular feature A RESCUE BULLETIN. *Those ppear in the 1 May 1945 issue.*

to the technical informa- below, a number of ideas eceived by this command equipment officers in over- d in the Zone of Interior e helpful. If you have any ıment or criticism on the hich your units are now you have developed any hich might be useful to they may be submitted to l through channels.

)FFICERS OVERSEAS

ıal Equipment Laboratory iaison officers overseas. are gathering information on the performance and of personal equipment now are also to assist personal icers when possible, and to estions to this laboratory modifications. Those now

ley B. Miller, Hqs. XXI mand.
lon W. Burch, Office of echnical Services, ATSCE,

or J. Monke, Hqs. Four- orce.

CLOTHING NOTES

t Sizes Save Q–1 Shoe In-

Insert, Flying, Electric, places the F–2 shoe insert d for combat use with F–2 ng suits, except for crew o are issued Boots, Felt,

, Outer, are available for e positions where the A–6 t, worn as an overshoe, is permit efficient discharge he felt boot is designed for ıe F–2 electric shoe insert adequate thermal insula- erature ranges where elec- is necessary, provided the dry. When this is worn, ear is eliminated from the y.

The Q–1, worn over the leather shoe, enables flying personnel to "walk out" in case of forced landing. *It cannot be too strongly emphasized that the A–6 flying boot must be worn over the Q–1 insert and the leather shoe.* This is essential to eliminate wire failure.

Fabricated of three layers of cloth (see illustration in AIR SEA RESCUE BULLETIN No. 10), the Q–1 has electrical wiring attached to the middle layer. If care is taken to issue the insert according to shoe size, much unnecessary wear and wire breakage will be prevented. For correct fit, Q–1 insert is procured in five sizes:

Insert size:	*For shoe size*
Small (S)	5½– 7
Medium (M)	7½– 8½
Large (L)	9 –10
Extra large (XL)	10½–11½
Extra, extra large (XXL)	12 –13

Stretching Service-Life of F–3 Suits

If necessary to replace or repair broken leads, terminals, post connections, terminal plate assemblies, or snap fasteners, follow AN 13–1–16, dated 25 July 1944. Be sure to place asbestos sheet on assembly to protect suit fabric and insulation patch when soldering lead wires to terminals. Use low temperature solder.

Hang suits to dry before storing; remove spots. Look for wear at all points where bending produces wiring breaks. Repair tears and snags immediately to keep maximum stocks in service. Connect suit only to 24-volt systems.

To expedite delivery of available F–3 suits and Q–1 inserts to overseas theaters, cable requests direct to Headquarters, Air Technical Service Command. Do not requisition F–2 and F–2A heated jackets and trousers, which have been superseded by the F–3 suit.

Summer Clothing

Recent physiological experiments have shown that contrary to earlier belief (as expressed in the "Notes" appearing in AIR SEA RESCUE BULLETIN No. 8), differences in the air permeability or porosity of fabrics that might be suitable for flying clothing have practically no effect on how hot the clothing makes the wearer. This holds for surrounding air movement up to 3–5 mph. In higher winds, the porosity will have a greater effect. On the other hand, the greater the thickness of the fabric used, or the more layers of fabric used, the greater is the insulation and the greater the heat load imposed on the wearer.

In short, clothing made of a tight-weave fabric will be no hotter to wear than one of a loose-weave fabric. The fabric thickness should, however, be kept to a minimum, and all unnecessary pockets, linings, belts, and other extra layers of fabrics should be eliminated. The tight-weave fabric provides much greater protection against insect bites and snag injury, is easier to wash and dry, and should, therefore, be used.

Quartermaster reports of some combat experiences with tight versus loose weave fabrics corroborate the above assertions. Comment of flying personnel is invited.

EMERGENCY RESCUE NOTES

Accidental Inflation of Dinghy

The accidental inflation of a dinghy occurred on a combat mission of a P–47 type aircraft. It happened shortly after a dive-bomb run and pull-out on a railroad bridge. The pilot, a squadron commander, was re-forming his flight over enemy territory when he suddenly noticed his dinghy, a British back-type, was inflating. Realizing the situation, he attempted to get a knife from his pocket. Terrific pressure blacked him out. On regaining consciousness and the capacity for mental coordination, he found that the dinghy had pierced itself on the edges of the armor plate. He pushed and shoved the voluminous folds of the deflated dinghy out of the way and immediately, getting the aircraft under control, headed for his base.

The accident was caused by a faulty loose safety device on the handle of the dinghy's inflating bottle. When examined, it was open but had only turned about one-eighth of an inch to release the carbon dioxide gas. The leaded safety wire holding the ring and cotter key in place through the oval handle was still intact. However, the safety wire was loose enough so that, in the handling of the parachute over a period of time, the cotter key slipped out of the hole in the bottle and apparently some maneuver of the plane on that particular mission was sufficient to loosen the handle enough for the gas to escape.

Although it is believed that the danger of accidental inflation during flight of the C–2 or AN–R–2A rafts has been reduced to a minimum, attention is called to a safety measure adopted by some organizations. A 4-inch, pointed, dinghy-deflator knife has been suspended from the instrument panel or some other suitable place in the cockpit. A PEO who recently visited this laboratory advised that, in his organization, a small packet containing a folding knife, signaling mirror, and whistle was sewed to the life vest in place of the shark deterrent packet, which was not needed in his theater. Whatever method is used, it would be well if the fighter pilot had ready access to some sort of knife with which accidental inflation of the dinghy could be counteracted.

Emergency Rations

A returned pilot, who served 2½ years as military attaché in Peru and who lived for a long time with Peruvian natives, reports a unique method of treating fresh fish which might be useful to men who are lost at sea in life rafts without the facilities of heat for cooking. This "cooking" method is widely used along the coast of Peru by native fishermen when no fuel supplies are available. The fish is first cleaned and the flesh cut up into small cubes, one-half to three-fourths of an inch in size. These are put in a container and fruit acid—usually lemon juice—is poured over the fish. This is allowed to stand for one-half hour until the flesh breaks up and appears flaky as if it had been boiled. The fish is then ready to eat. This pilot reports it edible and rather tasty.

Raw fish is usually unpalatable when a man is starving, often causing stomach disorders and vomiting. One feature the returnee emphasizes is that concentrated citric acid should be mixed with water to bring about a consistency of lemon or orange juice, as judged by the taste, before it is used. (Fruit juice powders from the Field Rations C, K or 10-in-1, might be tried to produce a synthetic fruit juice. The instructions with the rations are for a lemonade and will not produce a sufficiently concentrated juice. One 7-gram packet of synthetic juice in 2½ ounces of water should be used for the concentrate.) Fish "cooked" in this manner is known as "serviche" by Peruvian natives, and is widely eaten along the Peruvian coast. Returnee often ate "Serviche" while in Peru and reports that no danger of stomach disorder exists after it is eaten.

This method of preparing raw fish has not been tested and, therefore, cannot be recommended, but is submitted to you as an idea for experimentation. The reports of any trials of this procedure will be studied with interest by this command.

Shark Deterrent

The shark deterrent packet described before has been given a new stock number, 8300–623748. The correct nomenclature is Packet, Shark Deterrent, for Use With Life Vests. Supplementing what was previously said about the packet, the basis of issue will be one per person on flights over water with temperatures greater than 65° F. or between latitudes 45° N. and 45° S.

Drinking Water on the Oceans

It has long been recognized that the old "pint-a-day" water requirement for humans was inadequate in several respects. Evaluation of requirements, based on studies of humans at various temperatures, was made by the Office of Scientific Research and Development. The figures given in the following table indicate the minimum intake required to balance water losses at various temperatures. These requirements are predicated upon the survivor being relatively inactive, taking precautions against water loss, and a low caloric intake.

Mean Air Temp. (°F.)	Pints/Day/Man
90	6.2
80	4.0
70	3.3
60	3.0
50	2.8
40	2.7

A. *Source of water available*

1. *Rain.*—Rain-catching equipment consists of a 77-square-foot waterproof paulin. Specific equipment issued for water storage consists of plastic bags with a total capacity of 5 gallons. The limiting factor in the use of rain as source of drinking water is the rainfall frequency rather than the total rainfall. The character of the rainfall is such that the 5-gallon storage capacity can be filled from individual storms in areas of moderate rainfall frequency, assuming a 50 percent collection of the rainfall on a 77-square-foot area. The rains may be so grouped, however, that not all the storms will be useful b the limited storage capaci amount of useable rain water not only with the rainfall dist but also with the rate of consur

2. *Solar Still.*—A solar still has recently been standardize AAF is designated as Kit, S Distillation, Type LL–1, and requisitioned under Stock N 857910. This kit consists of th with accessories. The weight is approximately 3½ pounds displacement is approximately inches. At present the AAF suing any still for use with rafts because of the extreme li of space. Two kits are to be on multi-place rafts. (See TC 25–50.)

The still consists of a close parent, plastic cylinder, appro 30 inches long and 13 inches eter containing a sheet of black stretched across its diameter. these sponges are saturated water, the plastic cylinder infl excess sea water drained. T are tied to the raft and are float ocean with the sponges face the sun. Water vapor evapora the sponges is condensed on the cal envelope and collects in a The salt residue must be wash the sponges daily.

The yield of a solar still upon: the intensity and durati sunlight; the efficiency of th the conversion of solar energy distillation process; the heat- area of the still normal to th the sun; and finally, upon th factors involved in its operatio indicated that the mid-day effic eraged 52 percent, whereas th to sunset efficiency was 38 perc average yield per still under t mum solar conditions was 800 As tested, the sponges of the a normal tilt of 20° to the h Since these tests, provision made so that the sponges can to face the sun more directl altitudes, thus somewhat incre total yield.

3. *Expendable Sources.*—In to the equipment described, six ter Desalting Kits, Type JJ–1, a ard equipment for multi-pla One-man rafts are equipped kit. These kits each contain quets of a precipitating age processing bag. The purpose

ide a source of water in-
limatic conditions. How-
ce should be used only if
e such that neither the
rain-catching paulin can

lopments on Distillation

pated that a new design
soon replace the present
Then the new kit has been
its nomenclature, stock
ny pertinent technical or-
announced.

CHUTE NOTES

es of Parachutes

parachute after a bail-out
ling! These are the key
v AAF Manual 60–1 which
ublished for distribution.
E: See article on page 18.)

L INFORMATION

Escape from Aircraft

escapes have been made
ıp of a heavy bomber sub-
water, using the standard
ınected to a standard A–13
a D–2 oxygen cylinder.
ition of the A–13 regulator
s level with the head, nor-
mal breathing is possible. When it is lower, pressure of water causes a continuous flow of oxygen. When it is higher, suction required for oxygen is increased. In diving tanks, the equipment has functioned as deep as 50 feet. The A–15 regulator, which is to replace the A–13, cannot be used at present because it incorporates a diluter mechanism and does not have sufficiently high flow characteristics. Work is continuing to make the A–15 usable for underwater escape. Further tests are being conducted and results will be recorded in a future issue of the "Notes."

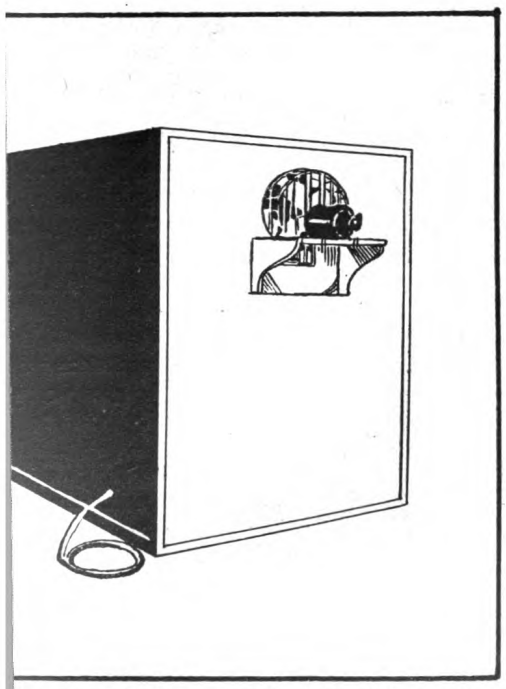
G-Suits

Work was started about a year ago to test suits that would protect fliers against the effects of positive acceleration. Tests showed a pneumatic suit to be most promising. In December 1944 and January 1945, service tests were conducted in the Ninth Air Force. As a result of these tests, suits were ordered for operational use in the Eighth and Ninth Air Forces. Suits have been used repeatedly in combat with the enthusiastic approval by a great majority of the pilots in units engaged in tactics requiring repeated exposure to positive acceleration. The benefits claimed by pilots are: (1) ability to glance around, and (2) reduced fatigue from repeated exposure even to small positive G–forces. Suits have now been supplied to other overseas units for trial.

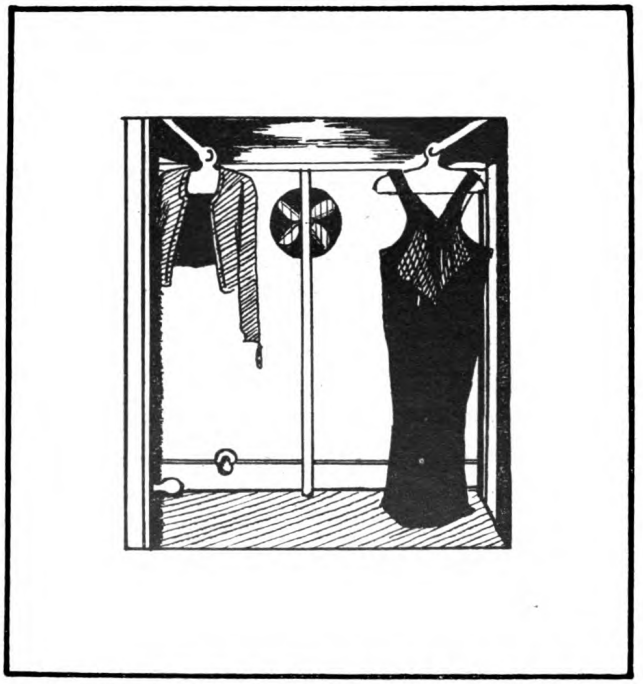
The suit now being supplied is the type G–3, using the type G–2 valve. The suit is a cutaway model worn over regular clothing. It contains an air bladder around the calves, thighs and abdomen. These bladders are inflated from a common airline leading from the G–2 valve, which in turn receives air from the pressure side of the instrument vacuum pump. The valve admits air automatically into the suit after 2.75 Gs are reached and with increasing pressure as the G is increased. After the maneuver producing positive G is over, the suit deflates automatically. Experiments are continuing to determine the best construction of suit for operational use in all climatic conditions. An older suit, the type G–2, which is no longer being supplied to overseas organizations, is being supplied to fighter commands in the United States for training purposes.

Flying Suit Drying House

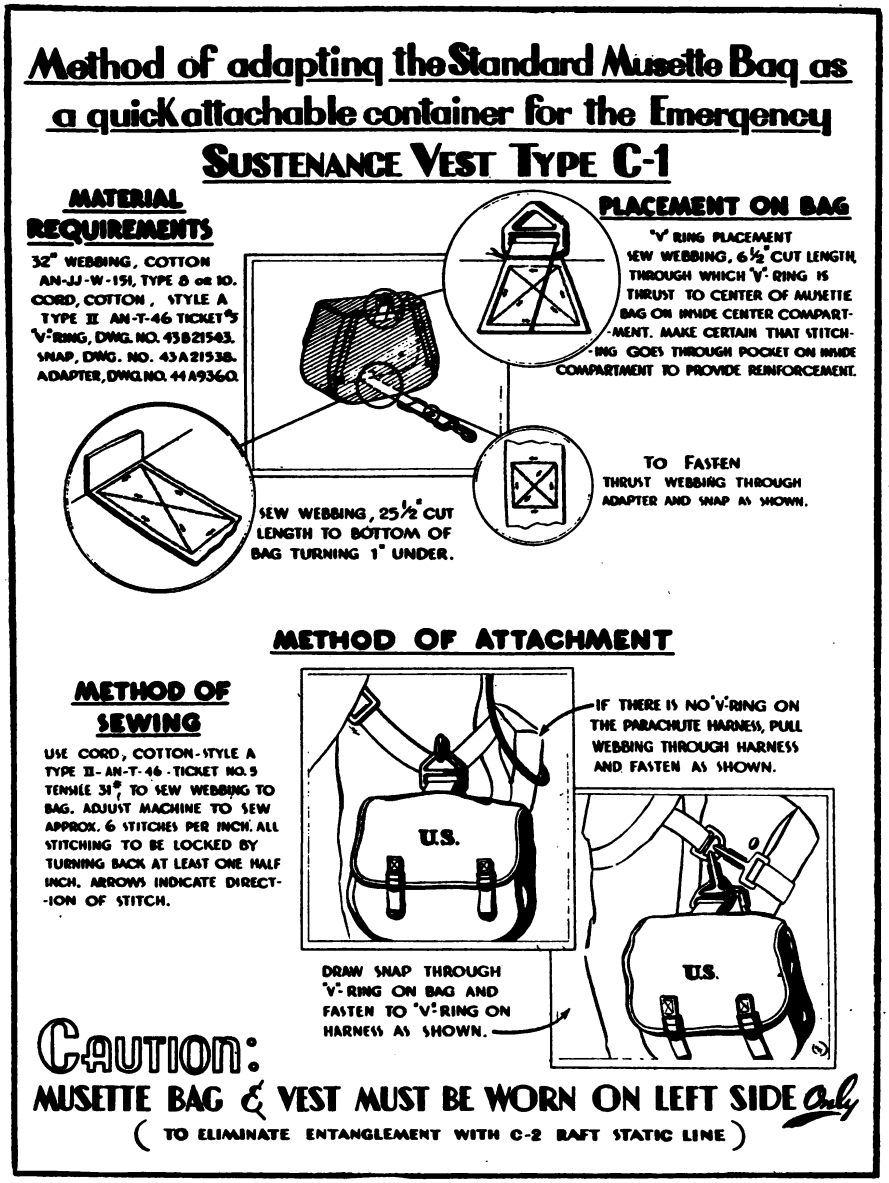
A prefabricated drying house has been developed and is being used by the Second Air Force. Easily assembled or knocked down for shipment, the drier is suggested for local construction, since it can be made from any ordinary boxwood, available at most bases. Used for



Flying Suit Drier. Note the exhaust fan mounted
ectric cord is seen coming from the corner of
The door is located on the side opposite fan.



Interior view of Flying Suit Drier. Electric light bulbs can be seen mounted at the bottom and exhaust fan is visible in back wall. The two racks running from front to back of the drier hold the hangers.



drying flying clothing and parachutes, the drier will normally dry clothing in from 4 to 6 hours without the aid of the heater unit. This unit can be of the type used to heat the cockpit and only one of the three exhausts is used, the other two being plugged up. The drier will house 30 flying suits. It has 13 100-watt bulbs, and a signal light on the outside of the unit which indicates whether the bulbs are on or off. It is wired with No. 14 box cable, No. 2 conductor, and each box is inter-connected to complete the circuit. Material includes 60 feet of cable, 14 octagon boxes and 14 receptacles. (See sketches, opposite page.)

Attachable Container for C–1 Vest

The use of the standard musette bag as a quick attachable container for the Emergency Sustenance Vest, Type C–1, is illustrated in the accompanying diagram. The illustration, shown above, includes the material requirements, method of attachment.

This command cannot recommend that the C–1 vest either should or should not be carried. It is mentioned here merely as a means of providing a carrying case if the respective air forces or commands authorize the use of the C–1 vest in this fashion. It should be borne in mind that the reason for designing the emergency kit in the form of a vest was to insure that it would be with the person at all times. Organizations in the theaters should decide whether it can safely serve its purpose if carried in the attachable bag.

Marking Oxygen Masks for Identification

Some method of markin masks is needed to assure tl that he has the mask which to him. The PEO of Chico Field, Calif., suggests using for this purpose.

Three names are cut leng the dog tag and it is then cut parts with the name on ea The tag is punched at each bent around the inlet hose di der the face part of the oxy and attached to the inlet hose safety wire. A dog tag machi essary for cutting the names.

This procedure is deemed b marking with numbers or let will facilitate immediate ret misplaced mask to the owner, owner's name, not merely a n attached. This nameplate c moved when the oxygen turned in or exchanged. The may be returned to service wi necessity of removing disfiguri fusing identification marks o

The tag also serves as ide of helmets, goggles and thr where all are attached togethe oxygen mask.

Ditching Questionnaires

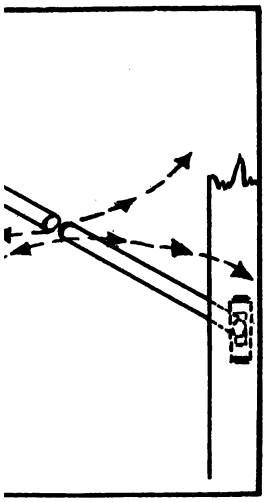
Get all the facts and rep Interrogation reports sent in have been found to lack impor More complete reports on crash landings and bail-outs included on the correct forms. MUSTS are: types of equipn item specifically responsible f equipment failures and narra the experience of each crew Speedy interrogation mean data.

Notes and Suggestions from There

1. A suggested plastic cup the mike turret in oxygen mas make it possible to wash the n out harm to the microphone.

2. Chutes in some parachute issued to the user with the thus forcing him to close i couraging him to make his ow inspection.

3. A few large photograph side of a parachute window, il the methods of carrying, wear and use of parachutes, have fective in encouraging good discipline.



ɜ rack permits any vest to
without taking off others.

k" system of parachute
ed at many bases. Para-
ed in block units and one
s inspected. This elimi-
cking of chutes or chute
ls. By the block system,
: is closed for inspection.
ɔde painted on the heels
e backs of gloves is used
at several heavy bomber

d found" box, painted a
placed in locker rooms,
very of misplaced equip-

ying suit testers at issu-
ng windows insure con-
circuits. These testers
ls containing a light, a
ugs and receptacles into
ngs are inserted. This
ch is useful only to the
ating circuit continuity
ice, aids discipline in the
ent. Do not use a high
A 24 V. battery is essen-

zipper bags, retained by
personnel, and made of
th by parachute service
convenient devices for
l effects of fliers during
old mike, helmets and
times.

; equipment report" is a
: some bases to initiate
regarding care of equip-
ort is sent within 21
ier who fails to return
item of equipment for

which hand receipt was issued. Acknowledgment is required and suitable action taken at once.

10. A rack for storing life vests that permits the removal of any one vest without removing others was devised by the PEO, Richmond AAB. This rack is merely two hinged arms that meet in the middle, a sort of double "swinging gate," enabling vests to be slid to one arm or the other across the meeting point so that a vest anywhere along the arm may be selected for use or inspection. The top of each gate arm is curved to fit the inside of life vest neck line. (See sketch.)

Pilot Adrift Five Days Makes Good Use of Equipment

His plane damaged during an island strike in support of the Okinawa operations, Ens. Jay Morton Finley bailed out at 300 feet over a glassy sea with 25-foot swells. He noticed no jerk when his chute opened, no impact when he hit the water a mile and a half from the enemy-held isle. Drifting NNE, once in his life raft, he stayed within sight of the island the rest of the day and within hearing distance most of the night.

Ensign Finley's drift continued the same until a northeasterly wind headed him back toward the island 2 days later. On his fifth day afloat, one of two patrolling PBMs landed on the water, rescued the survivor. The Mariner sustained sufficient damage upon landing to cause its survey upon return to base, but the rescue was successfully accomplished.

"Finley lost his Mae West, his paddles and his bailing cup on the fourth day as a result of his failure to make fast to the raft all articles of equipment. As circumstances developed these losses were inconsequential, but under other conditions would have been serious. When his life jacket went overboard he planned to rely on his anti-blackout suit for buoyancy if necessary. Second, he used his head, never lost his wits, and reaped benefits therefrom. By carefully arranging his diet and using his supplies sparingly he was well prepared for a longer voyage had such a situation developed. He had fished for a few minutes, but discontinued without success, planning to resume this employment later if necessary. (The only marine life with which he came into contact was a turtle the size of his raft. He heard a noise, looked out from under his poncho, and came face to face with this visitor about 1 foot away.)

"Ensign Finley's own advice is: Don't worry about being picked up. The more you worry the worse your condition will be when you're rescued. Don't get excited. Take plenty of time. Go slowly and think things out; you aren't going anyplace."

Some interesting comments on equipment resulted from the experience:

Plastic First-Aid Kit and Survival Flask.—One of two items found most useful. The small compass functioned perfectly but was difficult to operate due to tossing and pitching of the raft. The three packages of emergency rations plus an envelope of beef bouillon cubes and one vitamin tablet were all the food that Finley consumed during his 5-day cruise, yet he lost but 3 pounds. Ointment and band-aid were applied to treat a slight abrasion.

Signal mirror.—The mirror is the second item of primary importance. Ensign Finley practiced with the mirror prior to his rescue when the sun was out—and apparently benefited from the practice as the PBM pilot later informed him that he had kept the flash in his eyes for a full hour.

Life Raft.—Performed satisfactorily, requiring reinflation once a day.

Poncho.—Useful but difficult to arrange in watertight fashion. When there was danger of enemy aircraft, Finley turned blue side up, but when friendly character of PBM's was identified he reversed the sides to place yellow up.

Sea Anchor.—While drifting in the direction he desired, he kept his anchor aboard, using it when he deemed advisable.

Cloth Survival Handkerchief.—Completely accurate and indispensable.

Water.—Of the 3 pints of water and "makings" for 6 pints more on hand, the survivor used only a pint and a half.

Dye Marker.—Invaluable. Finley had equipped himself with three packages before take-off and attached them to his person, used dye marker over a wide area after sighting aircraft.

Back Pack.—Not used, but comfortable to have along as he sat on it to keep dry, floated easily once when the raft tipped over.

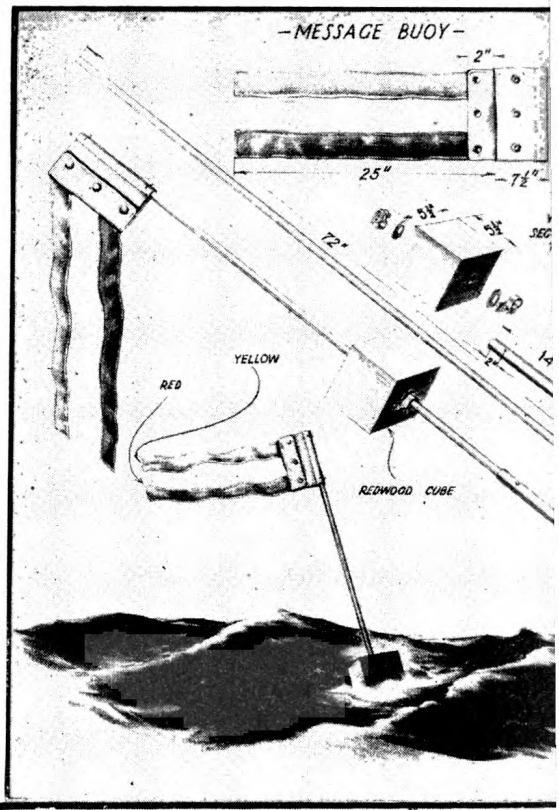
Pacific Rescue Unit Develops New Equipment

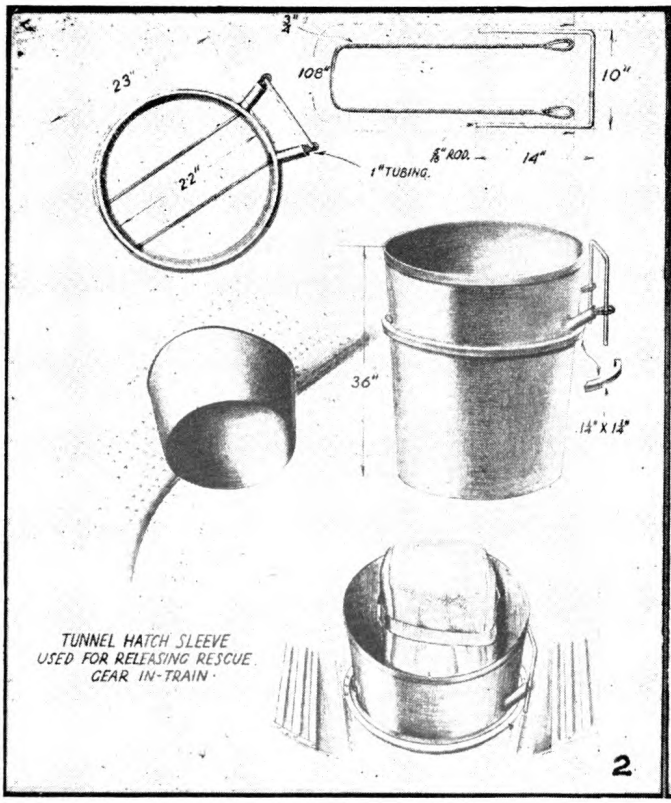
Rescue Squadron Three has developed and tested a message buoy, a tunnel chute for dropping gear, and a rescue ladder, in the course of their extensive rescue work in the Pacific. This gear was designed and built by the officers and men attached to the squadron and has proved to be successful under varying weather conditions.

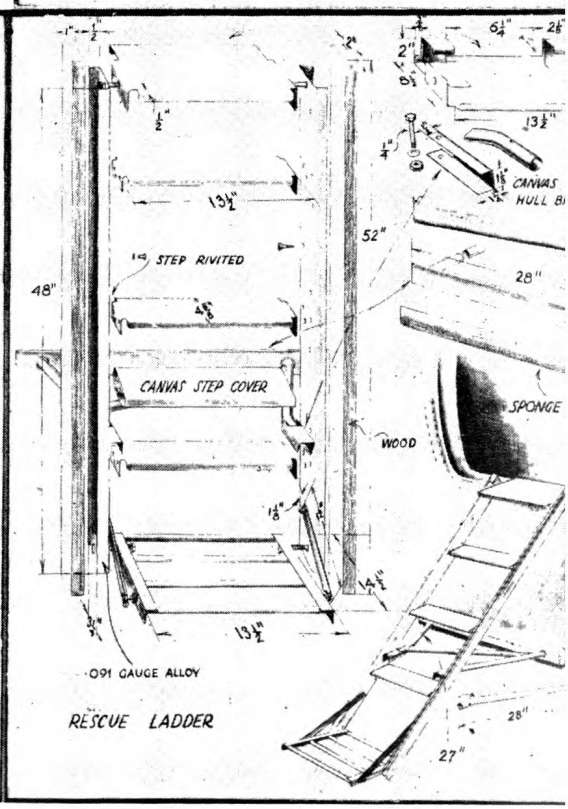
The message buoy aids survivors in spotting messages dropped from rescue planes. The message, printed on waterproof acetate and enclosed in a white canvas pouch with red and yellow streamers attached, floats about 3 feet above the surface. The buoy itself is a dowel 6 feet long, weighted at the bottom with pipe. (Fig. 1.)

The tunnel chute aids in dropping rescue gear from a plane to survivors. The chute increases the accuracy of the pilot's drop by eliminating the variable delay of throwing items over-board as well as the hazards to crew members when dropping units in train. (Fig. 2.)

The 52-inch rescue ladder is attached to the side of the plane by securing the lip on the top step to the edge of the PBM waist hatch. The steps are covered with canvas to increase friction and prevent injury from cutting. (Fig. 3.)







Index to Volume I of Air Sea Rescue Bulletin

{By Issues}

; issue of the AIR SEA RESCUE BULLETIN, Volume I (issues 1 through 12) is completed. This phabetical index has been compiled to facilitate use of past issues of the BULLETIN. Numbers ve, are dated June to December 1944, respectively. Numbers 7 through 12 are for January to he year of publication has been omitted in this index.

U. S. GOVERNMENT PRINTING OFFICE: 1945

COMMITTEES FOR AIR SEA RESCUE

1. Committee to Study the Preparation of Emergency and Survival Publications.

(Chm)	CG:	Lt. J. H. Bell, USCGR, 1516 14th St., NW.	ADams 2003
	Army:	Maj. Thomas Dunn, AC, Room 4E 144, Pentagon Bldg.	Army 73050
	Navy:	Lt. Comdr. Norville E. White, USNR, 2W30 Bg–W, Navy Depart.	Navy 4038 or 62953

2. Committee to Study Adequacy of Air Sea Rescue Facilities.

A. (Chm)	CG:	Comdr. W. B. Scheibel USCG, 1516 14th St. NW.	ADams 2003
	Army:	Maj. T. J. Borgman, AC, Room 4E 144, Pentagon Bldg.	Army 73538 or 71629
	Alt:	Maj. William J. Small, AC, Room 4E 144, Pentagon Bldg.	Army 73538
	Navy:	Lt. C. W. Brown, USNR, Room 1634 Temporary S. Bldg., 5th and Independence, SW.	Navy 61178

3. Committee to Study the Communication Facilities and Requirements for Air Sea Rescue.

(Chm)	CG:	Capt. E. M. Webster, USCG, Room 7300, CG HQ.	Navy 4444
	Army:	Maj. J. M. Sherman, AC, Room 4E 144, Pentagon.	Army 4847
	Alt:	Maj. T. J. Borgman, AC, Room 4E 144, Pentagon Bldg.	Army 73538 or 71629
	Navy:	Comdr. C. L. Harding, USCG, 2542 Navy Depart.	Navy 63636

4. Committee to Study Special Aircraft Equipment for Rescue and Survival.

(Chm)	CG:	Lt. Comdr. J. D. McCubbin, USCG, 1516 14th St. NW.	ADams 2003
	Army:	Capt. Wilfred Hines, AC, Room 4E 144, Pentagon Bldg.	Army 74687
	Alt:	Capt. Knute Flint, AC, Room 4E 144, Pentagon Bldg.	Army 73538
	Navy:	Lt. R. J. Willingham, USNR, 2W32 Bg–W Navy Depart.	Navy 62292 or 62953

5. Committee for Life Saving Equipment on Transp

A. (Chm.)	CG:	Comdr. M. de Martino, 14th St. N.W.	USC(Adan
	Army:	Major G. L. Johnson, Room 1E 668, Pentagon Bldg.	Army
	Army:	Mr. Phillip E. King, 3C 738, Pentagon Bldg.	Army
	Navy:	Lt. Comdr. J. L. Caillouet, Jr., USNR, Rm. 2011, Bg–T5, Navy Depart.	Navy

6. Committee to Study the Medical and Phys Aspects of Air Sea Rescue.

	CG:	Sr. Surgeon Paul A. Neal, USPHS, National Hygiene Research Lab., National Institute of Health, Bethesda, Md., Room 12.	WIsc Ex
	Army:	Capt. Charles R. Tittle, Office of Surgeon General, Room 422, 1818 H St. NW.	Army
	Army:	Col. William F. Cook, Office of Air Surgeon, Room 4C 174, Pentagon Bldg.	Army
	Alt:	Maj. Richard Follis, MC, Asst. Chief, Medical Safety Div., Office of Flying Safety, HQ, AAF, Winston-Salem, N. C.	
(Chm)	Navy:	Comdr. Owen W. Chenault (MC), USN, Room 2941A Navy Depart.	Navy
	Alt:	Lt. Comdr. Henry A. Schroeder (MC), USNR, Room 2941A Navy Depart.	Navy
	Navy:	Comdr. M. H. Goodwin, Rm. 1817, Navy Dept.	MC, U Navy 5
	Alt:	Capt. John H. Korb (MC), USN, Room 28, Pot-Ann Bg–3.	Navy
	RAF:	Wing Comdr. P. A. Lee, 1424 16th St. NW.	DE 90 Ext

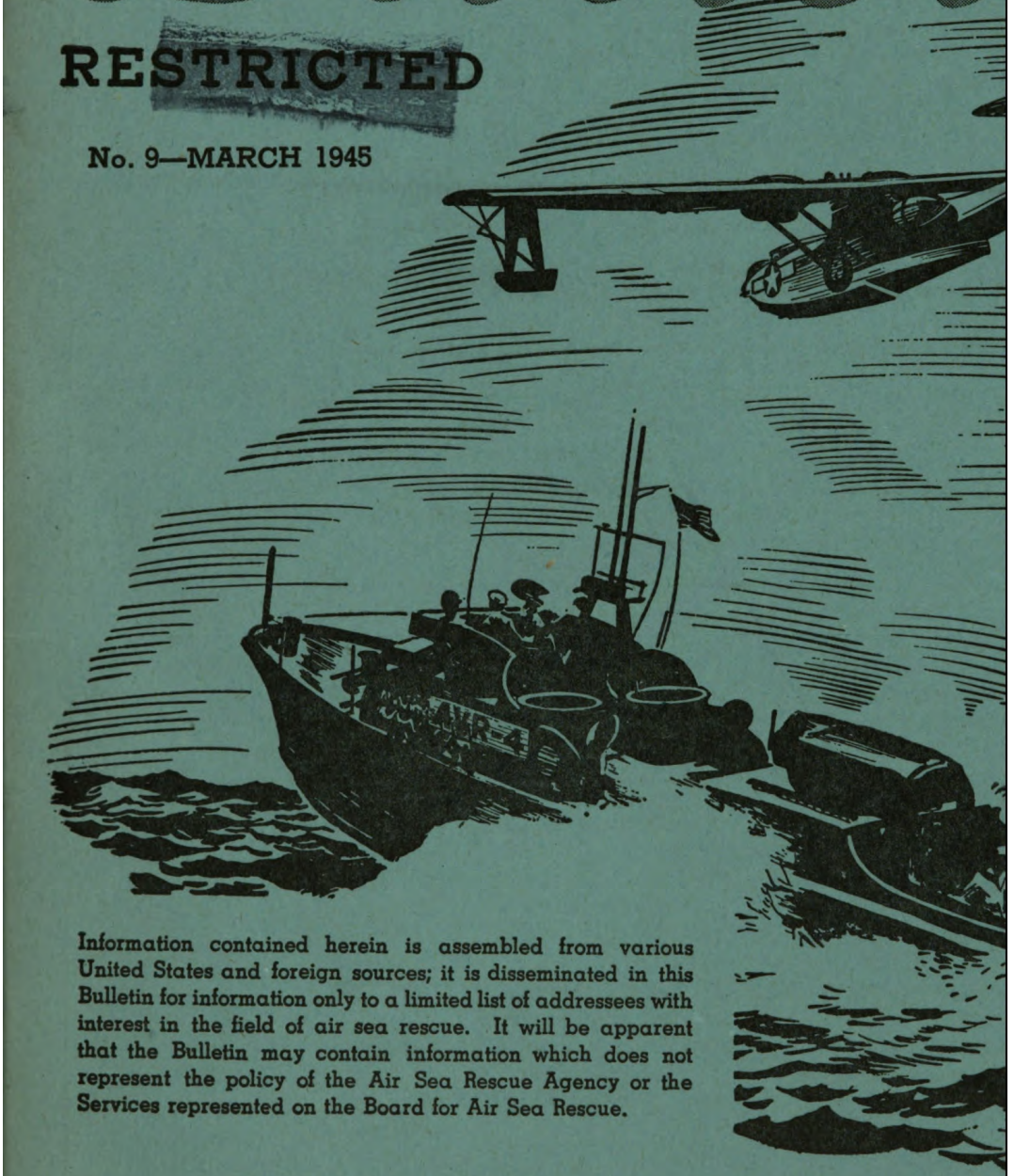
7. Committee to Study Ditching Procedures.
Membership of this committee is being rev
1 Ma

AIR SEA RE

Bullet

RESTRICTED

No. 9—MARCH 1945



Information contained herein is assembled from various United States and foreign sources; it is disseminated in this Bulletin for information only to a limited list of addressees with interest in the field of air sea rescue. It will be apparent that the Bulletin may contain information which does not represent the policy of the Air Sea Rescue Agency or the Services represented on the Board for Air Sea Rescue.

Published monthly by the United States Coas

AIR SEA RESCUE A

WASHINGTON, D. C.

AIR SEA RESCUE AGENCY

R. R. WAESCHE, Vice Admiral
U. S. Coast Guard

ROBERT DONOHUE, Rear Admiral
U. S. Coast Guard

BOARD FOR AIR SEA RESCUE

C. V. WHITNEY, *Colonel*, U. S. Army Air Forces
J. W. BURGARD, *Lieutenant Colonel*, U. S. Army Air Forces
W. J. RENN, *Lieutenant Colonel*, U. S. Army Service Forces
JAMES R. DUDLEY, *Captain*, U. S. Navy
PAUL FOLEY, JR., *Commander*, U. S. Navy

Executive Staff for Air Sea Rescue

W. A. BURTON, *Commander*, USCG, Executive Assistant
G. W. NELSON, *Commander*, USCG, Executive Officer
W. J. SMITH, *Commander*, USCG, Secretary of the Board
J. H. BELL, *Lieutenant*, USCGR, Chief of Information Section

Special Duty Staff Officers, Air Sea Rescue Agency

A. C. HOHN, *Commander*, (MC) USN
C. M. MURPHY, *Major*, AC, Army of United States
RUSSELL E. PIERCE, *Captain*, USMCR
E. J. SANGER, *Lieutenant*, USNR

AIR SEA RESCUE LIAISON OFFICERS

R. L. BURKE, *Commander*, USCG
Air Sea Rescue Liaison Officer
Commander Eastern Sea Frontier
90 Church Street
New York 7, N. Y.

A. E. HARNED, *Commander*, USCG
Air Sea Rescue Liaison Officer
% Staff, Commander 7th Fleet
% Postmaster
San Francisco, Calif.

E. E. Fahey, *Commander*, USCG
Air Sea Rescue Liaison Officer
% Commander Gulf Sea Frontier
Dupont Building, Room 926
Miami, Fla.

T. J. HARRIS, *Commander*, USCG
Air Sea Rescue Liaison Officer
% Commander Western Sea Frontier
Federal Office Building, Room 480
San Francisco 2, Calif.

A. J. DEJOY, *Commander*, USCG
Air Sea Rescue Liaison Officer
% Commander South Pacific Force
% Fleet Post Office
San Francisco, Calif.

D. O. REED, *Commander*, USCG
Air Sea Rescue Liaison Officer
Coast Guard Box # 1, Navy 48
% Fleet Postmaster
San Francisco, Calif.

CONTENTS

Communications to Air Sea Rescue Bulletin should be addressed:
AIR SEA RESCUE BULLETIN
AIR SEA RESCUE AGENCY
1516 Fourteenth Street NW
Washington, D. C.

JOINT EMERGENCY RESCUE OMMUNICATIONS PROCEDURE

›roved and Published by Authority of the Joint Communications Board for Use Where Military Situations Permit

Emergency Rescue Commu-
Procedure has been approved
ity of the Joint Communica-
d "for use where the military
›ermits." The Procedure, as
l by the Joint Secretariat,
following subjects:
ıft Safety Procedure.
ıft Emergency Procedure.
ıft Distress Procedure.
ı by Aircrew Afloat in Dinghy
Lifeboat.
ı by Search Aircraft.
ı by Search Surface Craft.
ı by Any Aircraft Witnessing
Forced Landing or Sighting
tressed Personnel.
ı by Surface Craft Witnessing
Forced Landing or Sighting
tressed Personnel.
ł of the publication follows:

rcraft Safety Procedure

ı the pilot of an aircraft is
of his position or a state of
is expected, but with the aid
stations can proceed on a
and at a suitable air field, he
e ground station using normal

› pilot is unable to contact the
ıtion or does not know what
call, he will use the interna-
ety Signal "TTT" on radio-
(CW) and/or "SECURITY"
lephone (Voice).
ı radiotelegraph (CW) is
smit "TTT" three times fol-
he call sign of the aircraft and
, bearing or course.
mple (Communication Good):

: TTT TTT TTT V ABC ABC ABC
INT QTF (QTE or QDM) K.

: ABC V DEF R K.
: DEF V ABC (2ø second dash) ABC
K.

: ABC V DEF QTF 3315 N — 753ø
W A 1745Z (or bear-in bearing or
course) K.
: DEF V ABC R $\overline{AR}$.

(2) Example (Communication Difficult):

Aircraft: TTT TTT TTT V ABC ABC ABC $\overline{INT}$ QTF (QTE or QDM) K.
Ground
Station: ABC V DEF R QTN 3 K.
Aircraft: DEF V ABC (2ø second dash) ABC (2ø second dash) ABC (2ø second dash) ABC K.
Ground
Station: ABC V DEF — G — QTF 3315N — 753ØW A $\overline{IMI}$ 3315N — 753ØW A 1745Z (or bearing or course).
Aircraft: DEF V ABC — ABC V DEF — G — QTF 3315N — 753ØW A 1745Z (or bearing or course) K.
Ground
Station: ABC V DEF C $\overline{AR}$.

b. When radiotelephone (voice) is used, transmit "SECURITY" three times followed by call sign and request fix (bearing or course).

(1) Example (for VHF):

Aircraft: Security --- Security --- Security --- This is Ringtop --- This is Ringtop --- This is Ringtop --- Request fix (bearing or course) --- Over.
Ground
Station: Ringtop --- This is Mitchel --- Transmit for fix --- (Any special instructions) --- Over.
Aircraft: Mitchel --- This is Ringtop --- Transmitting for fix --- One two three four five --- Five four three two one --- This is Ringtop --- Over.
Ground
Station: Ringtop --- This is Mitchel --- Your position is three three one five north --- Seven five three zero west --- Able -- Time one seven four five Zebra --- Over.
Aircraft: Mitchel --- This is Ringtop --- Roger --- Out.

(2) Example (for HF):

Aircraft: Security --- Security --- Security --- This is Ringtop --- This is Ringtop --- This is Ringtop --- Request fix (bearing or course) --- Over.
Ground
Station: Ringtop --- This is Mitchel --- Transmit for fix (any special instructions) --- Over.
Aircraft: Mitchel --- This is Ringtop --- Transmitting for fix (A 2ø second period during which no voice transmission is made but the microphone button remains depressed) --- This is Ringtop --- Over.
Ground
Station: Ringtop --- This is Mitchel --- Your position is --- Three three one five North --- Seven five three zero West --- Able --- Time one seven four five Zebra --- Over.
Aircraft: Mitchel --- This is Ringtop --- Roger --- Out.

3. The first transmission by the aircraft will be on the assigned air-ground frequency. If the aircraft is unable to establish communications on the assigned air-ground frequency, any of the control, operational or emergency frequencies will be used.

4. —

5. —

6. —

Aircraft Emergency Procedure

7. When an aircraft is in trouble and requires immediate navigation aid, the pilot will:

a. Turn on IFF emergency.

b. Call the ground station employing normal calling procedure, using the precedence prosign "O" for radiotelegraph (CW) and/or "Emergency" for radiotelephone (voice). Request fix (bearing or course), followed by:

(1) For radiotelegraph (CW): -- A 2ø second dash and call sign.

(2) For radiotelephone (voice) VHF: -- Count one to five and back.

(3) For radiotelephone (voice) HF--: A 2ø second period during which no voice transmission is made but the microphone button remains depressed and call sign.

c. Obtain receipt and acknowledgment from ground station to transmit emergency message.

d. Transmit emergency message, containing the following information:

(1) Best estimated position and time thereof.

(2) Course and speed.

(3) Altitude of the aircraft.

(4) Available flight time.

(5) Intention of the airplane commander as to ditching, bailing out or crash landing.

(Continued on next page)

READY REFERENCE CARD FOR AIRCRAFT IN DISTRESS

A "Ready Reference Card for Aircraft in Distress" was prepared and distributed by Commander Fleet Aircraft, Alameda, to Navy operating s in the Northern California Sector.

These 8-inch square cards fit conveniently into the file in the pilot's chart board. They are distributed to the pilots by the squadron ACI off are prepared to brief pilots on use of the cards. The card is to be kept in the plane for use as a check-off list when an emergency occurs.

It is expected that similar cards will be adopted by other Army and Navy flight organizations in the Western Sea Frontier. The Fourth Ai present is working on an emergency check-off list which will be a decalcomania for posting in the cockpit.

The COMFAIR card follows:

OPERATIONAL INTELLIGENCE SECTION, COMFAIR, ALAMEDA - DATE ———

FOR PILOT OF PLANE IN TROUBLE

1. Turn on emergency IFF and **leave it on.**
2. Head for nearest landing field.
3. Call radio guard station and give:
   - **(a)** Position
   - **(b)** Difficulty
   - **(c)** Anticipated action (ditching, bailing out, heading for —, etc.)
   - **(d)** Weather, state of sea
   - **(e)** Planes in company
4. Advise planes in company of your trouble and intended action.
5. Send MOs on regularly assigned frequency.
6. If ditching is contemplated, check Ditching Bill and also be sure you have in mind what you intend to do **after** you hit the water. Conserve distress signaling devices as far as possible.

IF IN DOUBT

ABOUT EMERGENCY STATUS, REPORT IT ANYWAY IN ORDER THAT PREPARATIONS MAY BE MADE BY AIR-SEA RESCUE SERVICE TO RENDER IMMEDIATE ASSISTANCE, IF NEEDED.

FOR USE IN NORCAL SECTOR, WESTERN SEA FRONTIER

FOR AIRCRAFT SIGHTING PLANE IN TROUBLE

1. Turn on emergency IFF and **leave it on** while scene. (**Be sure** to turn off emergency IFF when leave scene.)
2. Drop float light **and** dye marker. Circle survivors safe altitude and minimum safe speed, keeping p tion visually or by instruments.
3. Drop life raft, if needed.
4. Call base radio and give:
   - **(a)** Position
   - **(b)** Identification of disabled plane
   - **(c)** Apparent condition of survivors
   - **(d)** State of weather and sea
   - **(e)** Action being taken at scene
5. Send MOs continuously for ten (10) minutes in ec half hour period on regularly assigned frequency. not shift frequency.
6. If in doubt as to whether crash occurred, or if sus cious circumstances exist, send in report of details order that a search may be made without delay.
7. **If more than one aircraft at scene,** senior pi should—
   - **(a)** Direct other aircraft to circle counterclockw at medium altitude, standing by to perform, designated, any or all of the foregoing fu tions.
   - **(b)** Make sure that only planes directly o survivor have emergency IFF switch on.
   - **(c)** Keep in mind advantages of altitude in co municating with base, particularly by VHF.
   - **(d)** If not in communication with base, send o plane to nearest field to phone crash report.

RESTRICTED **AIR-SEA RESCUE** **RESTRICTE**

COMMUNICATIONS PROCEDURE
(Continued from page 2)

NOTE.—For ground station: ___ During this transmission, on VHF, D/F station can take bearing.

e. Obtain from ground station receipt for emergency message with fix, bearing or course and special instructions.

8. Examples.

a. For radiotelegraph (CW):

Aircraft: DEF V ABC O INT QTF (QTE or QDM) (2 second dash) ABC K.
Ground Station: ABC V DEF R K.
Aircraft: DEF V ABC O (Transmits emergency message) K.
Ground Station: ABC V DEF R-O (sends fix, bearing or course and special instructions) K.
Aircraft: DEF V ABC R AR.

b. For radiotelephone (voice)

Aircraft: Mitchel ___ This is Ring EMERGENCY ___ Req (bearing or course) ___ This top ___ Over.
Ground Station: Ringtop ___ This is Mit Roger ___ Transmit emerger sage ___ Over.

ft: Mitchel ... This is Ringtop ... EMERGENCY ... (Transmits emergency message) ... This is Ringtop ... Over.
d
n: Ringtop ... This is Mitchel ... Roger ... (sends fix, bearing or course and any special instructions) ... Over.
ft: Mitchel ... This is Ringtop ... Roger ... Out.

radiotelephone (voice) HF:

ft: Mitchel ... This is Ringtop ... EMERGENCY ... Request fix (bearing or course), followed by a 2Ø second period during which no voice transmission is made but the microphone button remains depressed) ... This is Ringtop ... Over.
id
n: Ringtop ... This is Mitchel ... Roger ... Transmit emergency message ... Over.
ft: Mitchel ... This is Ringtop ... EMERGENCY ... (Transmits emergency message) ... This is Ringtop ... Over.
id
n: Ringtop ... This is Mitchel ... Roger ... (sends fix, bearing or course and any special instructions) ... Over.
ft: Mitchel ... This is Ringtop ... Roger ... Out.

ne aircraft is unable to contact nd station or does not know tion to call, use the internagent signals, "XXX" on radio- (CW), and "PAN" on phone (voice).

en radiotelegraph (CW) is ansmit "XXX" three times by call sign of aircraft three request for fix (bearing or a 2Ø second dash and call sign t. The procedure then follows raphs 7–c, d and e above.

le:

ft: XXX XXX XXX V ABC ABC ABC INT QTF (QTE or QDM) (2Ø second dash) ABC K.
nd
n: ABC V DEF R K.
ft: DEF V ABC (Transmits emergency message) K.
nd
n: ABC V DEF (sends fix, bearing or course and any special instructions) K.
ft: DEF V ABC R AR.

en radiotelephone (voice) VHF transmit "PAN" three times by call sign of aircraft three equest fix (bearing or course) sign. The procedure then folparagraphs 7–c, d and e above.

le:

ft: PAN ... PAN ... PAN ... This is Ringtop ... This is Ringtop ... This is Ringtop ... Request fix (bearing or course) ... This is Ringtop ... Over.

Ground
Station: Ringtop ... This is Mitchel ... Transmit emergency message ... Over.
Aircraft: Mitchel ... This is Ringtop ... (Transmits emergency message) ... This is Ringtop ... Over.

Ground
Station: Ringtop ... This is Mitchel ... (Sends fix, bearing or course and any special instructions) ... Over.
Aircraft: Mitchel ... This is Ringtop ... Roger ... Out.

c. When radiotelephone (voice) HF is used transmit PAN three times followed by call sign of aircraft three times, request fix (bearing or course) followed by 2Ø second period during which no voice transmission is made but the microphone button remains depressed, then transmit call sign. Procedure then follows subparagraph 7-c, d and e above.

Example:

Aircraft: PAN ... PAN ... PAN ... This is Ringtop ... This is Ringtop ... This is Ringtop ... Request fix (bearing or course) ... (A 2Ø second period during which no voice transmission is made but the microphone button remains depressed) ... This is Ringtop ... Over.

Ground
Station: Ringtop ... This is Mitchel ... Transmit emergency message ... Over.
Aircraft: Mitchel ... This is Ringtop ... (Transmits emergency message) ... This is Ringtop ... Over.

Ground
Station: Ringtop ... This is Mitchel ... (Sends fix, bearing or course and any special instructions) ... Over.
Aircraft: Mitchel ... This is Ringtop ... Roger ... Out.

10. The first transmission by the aircraft will be on the assigned air-ground frequency. If the aircraft is unable to establish communications on the assigned air-ground frequency, one or more of the following will be used:

a. The international distress frequency, 5ØØ kc.

b. U. S. emergency and safety frequency 828Ø kc.

c. Any other available frequency in an effort to establish contact with any ground station.

11. When the aircraft no longer is in danger, the International Urgent Signal must be cancelled on the same frequency by appropriate message.

a. *Examples:*

(1) For radiotelegraph (CW):

Aircraft: DEF V ABC QQZ XXX K.
Ground
Station: ABC V DEF R AR.

(2) For radiotelephone (voice):

Aircraft: Mitchel ... This is Ringtop ... Cancel emergency message ... Over.
Ground Station: Ringtop ... This is Mitchel ... Roger ... Out.

b. Special care will be taken to authenticate cancellation messages in those areas where authentication systems are in effect.

12.—

13.—

14.—

15.—

Aircraft Distress Procedure

16. When an aircraft is threatened by serious and imminent danger and requires *immediate assistance*, the pilot will:

a. Turn on IFF emergency.

b. Transmit SOS on CW and/or "Mayday" on voice followed by aircraft identification and a 2Ø second dash.

(1) When CW is used, transmit "SOS" (three times) followed by call sign of aircraft (three times), a 2Ø second dash and call sign of aircraft.

Example:

Aircraft: SOS SOS SOS V ABC ABC ABC (2Ø second dash) ABC K. (Listen and repeat.)

(2) When VHF is used, transmit "Mayday" (three times) followed by call sign of aircraft (three times).

Example:

Aircraft: Mayday ... Mayday ... Mayday ... This is Ringtop ... This is Ringtop ... This is Ringtop ... Over. (Listen and repeat.)

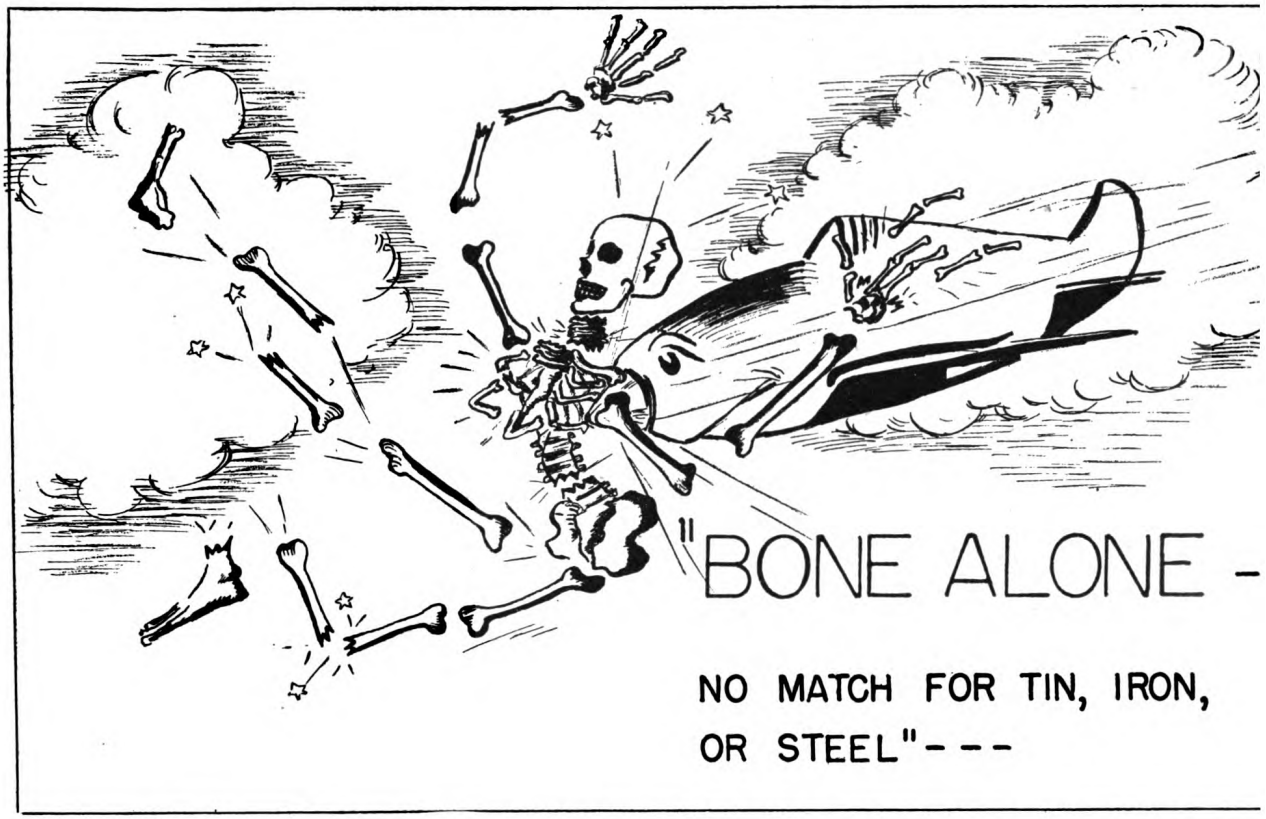
(3) When HF (voice) is used, transmit "Mayday" (three times) followed by call sign of aircraft (three times), a 2Ø second period during which no voice transmission is made but the microphone button remains depressed, and call sign of the aircraft.

Example:

Aircraft: Mayday ... Mayday ... Mayday ... This is Ringtop ... This is Ringtop ... This is Ringtop ... (A 2Ø second period during which no voice transmission is made but the microphone button remains depressed) ... This is Ringtop ... Over. (Listen and repeat).

c. The first transmission by the aircraft will be on the assigned air-ground frequency. If the aircraft is unable to establish communications on the assigned air-ground frequency, one or more of the following will be used:

(Continued on next page)



NEW ZEALAND MEDICAL ASPECTS OF AIR-SEA RESCUE AND DITCH

With Preface By U. S. Flight Surgeon

Various medical aspects of air-sea rescue are treated in an eight-page, typewritten booklet entitled *Readiness,* Issue No. 13, published by Zealand Air Intelligence, Air Department, Wellington.

Excerpts from the booklet which appear in this article concern only medical factors in ditching and action to take immediately thereafter. reprinted for information only.

Prefatory comments by a U. S. Navy flight surgeon (*in italics*) appear in the next two paragraphs, preceding the first portion of the excerpt New Zealand book.

In considering the framework of the body, it is immediately obvious that bone alone is no match for tin, iron or steel. Careful observation, however, reveals that certain parts of the body originally were designed for stress and weight bearing. The arch of the foot, the angular leg bones, the curvature of the spine and the free mobility of certain joints all tend to lessen the jarring effect of walking or physical impaction. Bearing this in mind, Navy flight surgeons advise that it is possible to use the physical design of the body in meeting the initial and final impact of a forced landing.

Every object in an airplane moves with the aircraft in gyration and speed. Whenever the speed factor is alerted suddenly, attached objects bear a part of the weight of deceleration stress, but unatta jects do not decelerate as rapidl continue forward at the initial sp if the deceleration differential they become literally flying missile the problems involved in survivi ings and crash landings success place, attitude and position.

(Continued on page 7)

COMMUNICATIONS PROCEDURE

(Continued from page 4)

(1) The international distress frequency, 500 kc.

(2) U. S. emergency and safety frequency, 8280 kc.

(3) Any other available frequency in an effort to establish contact with a ground station.

d. If time permits, the following information should be transmitted:

(1) Best estimated position and time thereof.

(2) Course and speed.

(3) Altitude of the aircraft.

(4) Intention of aircraft commander as to ditching, bailing out or crash landing.

e. Immediately prior to ditching, bailing out or crash landing, the pilot or radio operator will tie down the CW key. If the aircraft is equipped with VHF, the pilot will break the safety wire on the VHF control switch and throw the switch to transmit position, or use any other means available to obtain continuous transmission.

f. If the aircraft no longer is in distress, a message cancelling the state of distress must be transmitted same frequency.

(1) *Examples:*

(a) For radiotelegraph (CW)

Aircraft: DEF V ABC QQ Z SOS K

Ground Station: ABC V DEF R AR.

(b) For radiotelephone (voice

Aircraft: Mitchel ... This is Ringtop distress message --- Over.

Ground Station: Ringtop --- This is M Roger --- Out.

g. If the aircraft has cra ditched and the controlling station (or controlling author

that a state of distress no
cists, a message cancelling the
distress will be transmitted by
rolling ground station on the
quency.
cial care must be taken to
ate cancellation messages in
eas where authentication sys-
in effect.

y Air Crew Afloat in Dinghy or
at

r crew in dinghy or airborne
should use some or all of the
; methods to attract attention:
en no aircraft or surface craft
or heard in the vicinity:
Gibson Girl" transmitter (SCR–
r AN/CRT–3). This trans-
should be operated approxi-
five minutes of each fifteen
coinciding with the inter-
silence periods at X:15 and
lock if possible.
Walter" (AN/CPT–2). This
nt should be operated inter-
y.
Corner" (MX–137/A or MX–
This equipment should be

en aircraft or surface craft are
eard in the vicinity:
Gibson Girl" transmitter (SCR–
r AN/CRT–3). This trans-
ould be operated continuously.
Walter" (AN/CPT–2). This
nt should be operated con-
y.
Corner" (MX–137/A or MX–
This equipment should be

e pyrotechnics.
se paulin for flag signaling.
se mirror for flash signaling.
ow whistles in fog or darkness.
ay a colored trail on the sea by
uorescein.
se any other method signaling
et attention.

By Search Aircraft
hen a search aircraft is dis-
on an emergency rescue mission.
e following frequencies if pos-
ll be guarded continuously:
On scene" frequency.
Ø kc. (by means of automatic
finder).

(3) The base frequency.
(4) The VHF common frequency.

b. Search equipment should be operated to detect presence of "Walter" and corner reflector ("Emily").

c. Communication between all search craft should be on the "on scene" frequency.

25. To establish communications:

a. With any Coast Guard base or boat, call and listen on 267Ø kc.

b. With a Navy base or boat, call and listen on 2716 kc.

c. With an Army Air Forces air-ground station, on frequencies as specified in AAF radio facility charts and similar documents provided by the dispatching authority.

d. With towers or range stations call by voice using 4495 or 621Ø kc and listen for reply on the proper tower or range frequency.

26. Search aircraft having sighted distressed aircrew, while circling the position, will:

a. When installed, turn on emergency IFF. (When leaving the immediate scene of distress, emergency IFF should be turned off.)

b. Notify the base station, indicating the location and whether assistance is needed.

c. When assistance is needed to complete the rescue, transmission can be made on 5ØØ or 828Ø kc so that shore stations can obtain a fix and surface and aircraft can "home" on the scene.

27. When the rescue is effected and the rescue craft is proceeding to the base, the base station will be notified.

28. —
29. —
30. —

Action By Search Surface Craft

31. When a search surface craft is dispatched on an emergency rescue mission:

a. The following frequencies if possible shall be guarded continuously:

(1) "On scene" frequency.
(2) 5ØØ kc. (By means of automatic direction finder).
(3) The base frequency.
(4) The VHF common frequency.

b. Communication between all search craft should be on the "on scene" frequency.

32. To establish communication:

a. With any Coast Guard base or boat, call and listen on 267Ø kc.

b. With a Navy base or boat, call and listen on 2716 kc.

c. With an Army Air Forces ground station, on frequencies as specified in AAF radio facility charts and similar documents provided by the dispatching authority.

d. With towers or range stations, call by voice using 4495 kc or 621Ø kc, and listen for reply on the proper tower or range frequency.

33. Search surface craft, having sighted distress aircrew, will:

a. Notify the base station, indicating the location and whether assistance is needed.

34. When rescue is effected, the base station will be notified.

35.—
36.—
37.—

Action by Aircraft Witnessing a Forced Landing or Sighting Distressed Personnel

38. Aircraft observing an incident should:

a. Keep aircraft or distressed personnel in sight.

b. Turn on IFF emergency.

c. Notify the ground station of the pertinent facts, giving the following information or applicable parts thereof:

(1) Type of aircraft or surface craft.
(2) Location—By geographic point or bearing or distance from some fixed point, or latitude and longitude.
(3) Time of crash or forced landing.
(4) Personnel.
(*a*) Number.
(*b*) Whether seen to bail out.
(*c*) Whether known to be afloat.

d. Remain on scene as long as endurance permits, or until directed otherwise.

e. Transmit, if possible, appropriate signals on 5ØØ kc to alert Navy (Coast Guard) bases or units which maintain watch on this frequency and to aid rescue aircraft or surface craft to home on the location of the distress personnel.

f Transmit, if possible, the appropriate signals for HF/DF fix on the control frequency or on 828Ø kc. A constant HF/DF watch is maintained by all AAF and Navy (Coast Guard) HF/DF stations on 828Ø kc.

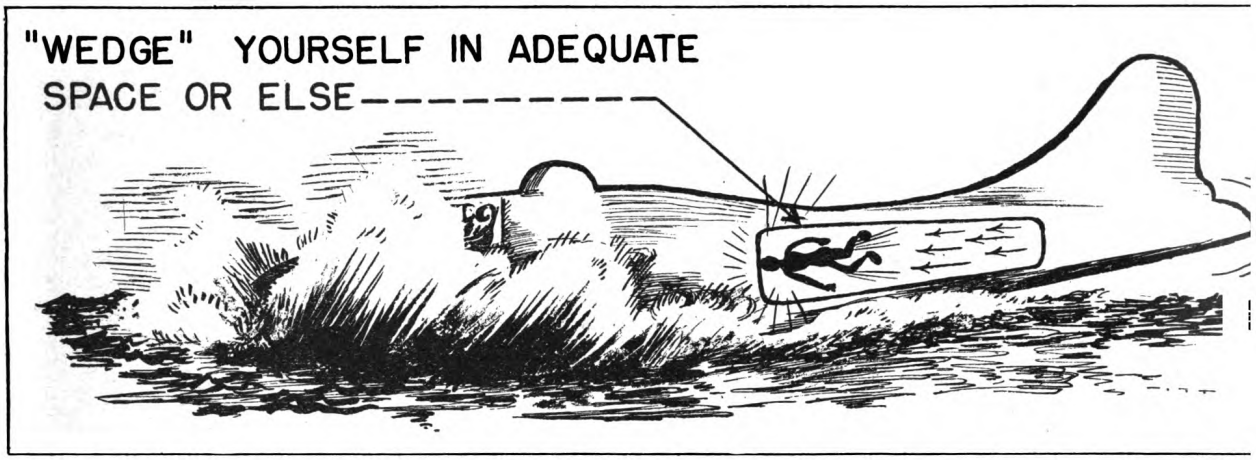
g. Transmit, if possible, appropriate signals for VHF/DF fixes.

h. Turn off emergency IFF when departing from the immediate scene of the incident.

39.—
40.—
41.—

(Continued on next page)

BONE ALONE (*Continued from page 5*)



REASONING BEHIND DITCHING STATIONS CHOSEN—FROM *"READINESS"*

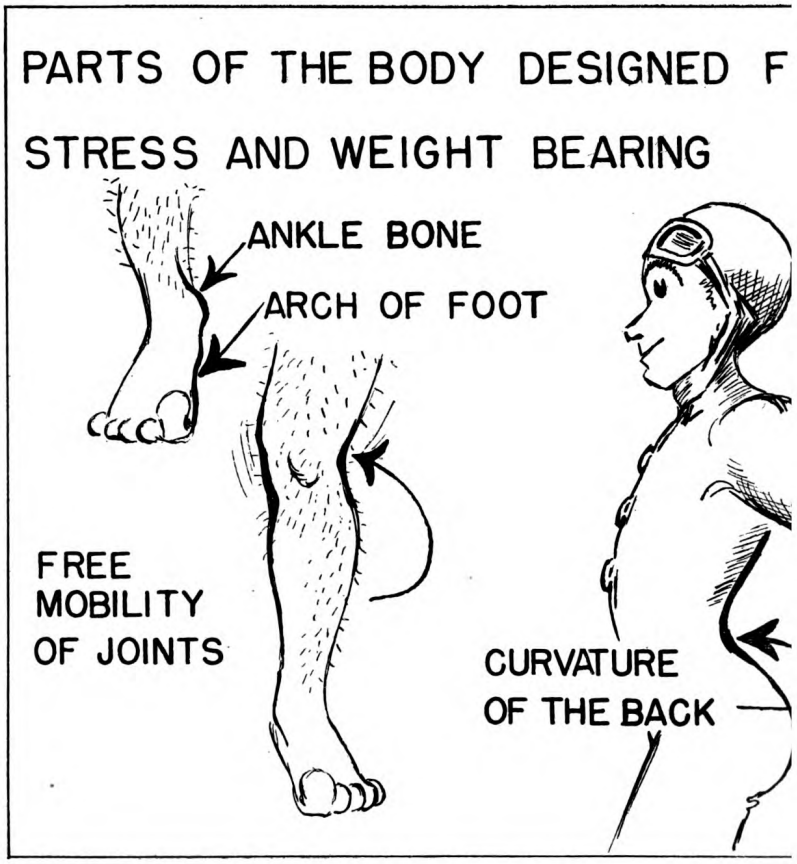
When an aircraft stops, all objects tend to move forward in relation to the aircraft at first, and then stop when they hit a part of it. Objects which are fixed to an aircraft slow down with it. Objects which are free move forward with the speed of the aircraft before it ditches and then stop very much more suddenly when they strike a solid obstruction.

Since the force developed depends on the speed of stopping or deceleration, it follows that a smaller force will be applied to a fixed object than one which is free.

Again, if an object has a small area of contact with the aircraft, the force per unit of area, or pressure, developed at the point of contact will be much greater than if there is a large area of contact. The total force developed by the stopping will be the same in both cases, but in one case this force must all be transmitted through a much smaller area.

Therefore, for maximum protection on ditching one should be firmly wedged in the plane and should have as large an area as possible against a bulkhead. This means, normally sitting crouched up with one's back against a partition, looking backwards. In addition, if the head is not carefully pressed against the partition—although the body stops with the aircraft—the head may move forward because of the flexibility of the neck, and either hit an obstruction with great violence, or the neck may dislocated. Consequently, it important to hold the head v hands if it cannot be presse against the same support as the

A limb which is supported point in its length is subject strain and may be broken. positions with the legs forward so good because practically th force is transmitted to the feet do not present a very large area



COMMUNICATIONS PROCEDURE

(*Continued from page 6*)

Action By Surface Craft Witnessing a Forced Landing or Sighting Distressed Personnel

42. Surface craft witnessing a forced aircraft landing or distressed personnel should:

a. Render immediate assistance.

b. Notify shore stations of the situation and action taken, and advise whether further assistance is necessary.

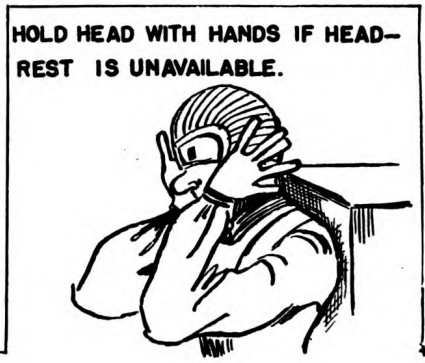
43.—

44.—

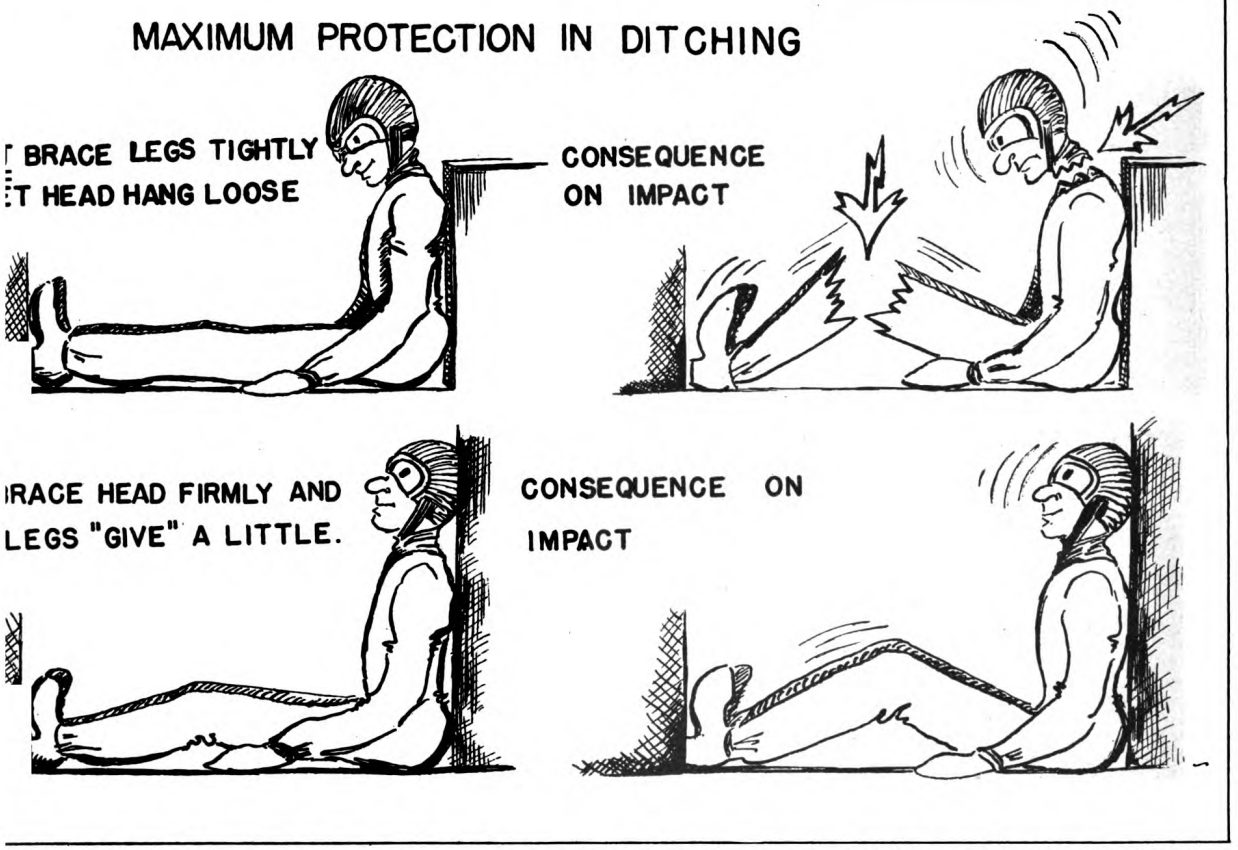
45.—

s great. However, the legs
o that the body does not stop
uickly as the plane. If injury
t, it usually affects the legs.
njury is not often fatal. Head
difficult in this position.
ly head injuries are the most
serious injuries in ditchings
es. Not only is the support of
vital, but also it is important
own any loose objects which
ound.
hing, the aircraft usually has
ks: one when the tail strikes,
econd when the nose hits the
ometimes the first shock dis-
e crew from the satisfactory

sink you. It becomes saturated with water and is approximately as heavy as water. From a floating point of view it is about neutral. It takes some time



DON'T go in the water from a bomber unless you must. There are recorded instances of airmen diving into the sea to rescue some unimportant bit of equipment. This should be avoided if possible. It makes a tremendous difference if a thorough wetting can be evaded at the beginning. IF you must enter the water, slide or jump in as gently as possible, holding your nose and closing your mouth tightly. To dive boldly into a rough sea while wearing a Mae West is unpleasant and makes your chances of swallowing sea water much greater. Sea water in the stomach increases seasickness very markedly.



hey have taken and the second
ich may be more severe, finds
bad position. It is important,
only to be in a good position,
o be *firmly* wedged into it.

BEFORE DITCHING

resupposed that ditching sta-
l the adjustment of the life
ve been attended to.)
remove any clothing. Heavy
n the water does impede swim-
l makes it more difficult to
o the dinghy; *but* it does *not* to expel all the air, so at first heavy clothing actually is buoyant.

When in the dinghy, the advantages of having clothing are so great that one should wear as much as possible. Even if clothing is wet, it serves as protection against cold and the elements.

Try to take one or more parachutes and any spare clothing into the dinghy. Since this is additional to all the rest of the emergency equipment, it often will be impossible; but these are very useful if available.

ADDITIONAL INSTRUCTIONS

If you are in the sea DON'T swim aimlessly. A person can become exhausted in a very brief time under these conditions, and then there is no more swimming. Float long enough to make sure of an objective, and then swim for it.

If there is an injured man in the water, it is rather difficult to get him aboard the dinghy by pulling first his head, then his body and finally his legs.

(Continued on page 18)

AIR FORCES ESTABLISH CONTINENTA EMERGENCY RESCUE SYSTEM

AAF Regulation 20-54 Assigns Areas and Responsibilities tc Numbered Air Forces and Major Commands; Terms Definec

Emergency rescue is defined and a continental AAF emergency rescue system established in AAF Reg. No. 20–54 by the assignment of areas and responsibilities to the numbered air forces and major commands. An amplifying parenthetical note states: "Nothing in this regulation will be interpreted to apply to aircraft crash rescue and fire fighting on or in the immediate vicinity of a base or to marine equipment assigned for other than emergency rescue purposes." The regulation is paraphrased in the following summary.

Emergency rescue control centers are defined as those installations so designated by the commanding general of each numbered air force and charged with directing AAF emergency rescue operations within specified areas, which are assigned to the commanding generals for the organization and operation of an adequate emergency rescue coverage.

Emergency rescue detachments of personnel and equipment are assigned to numbered air forces and attached to bases not under the command jurisdiction of the air forces.

ASSIGNED AREAS

Within the continental limits and adjacent waters, the territory is divided into four air force emergency rescue areas. (See figure 1 for boundaries.)

The regulation directs commanding generals of each air force to establish emergency rescue control centers and to determine the respective regions which will be served by each within their area. A consolidated list of all emergency rescue control centers in the United States will be published by Headquarters, AAF.

The commanding general, Air Transport Command, is made responsible for the organization and operations of emergency rescue service along ATC foreign routes, or portions of these routes, which are not covered by theater or continental rescue organizations.

642936—45——2

EMERGENCY RESCUE SYSTEM

Organization and Responsibility

Headquarters, AAF, will establish over-all emergency rescue policies and operating procedures, including: air-ground and ground-air communications operating procedures; responsibilities of emergency rescue control centers; coordination and liaison among numbered air forces, and between these and major AAF commands; methods of emergency rescue; allocation and reallocation of emergency rescue facilities, personnel and equipment; and designation of AAF installations for locating emergency rescue detachments within an emergency rescue area, when the commanding general of a numbered air force having the responsibility within that area cannot obtain adequate coverage by using bases under his command.

Numbered Air Forces and Commands

The commanding general of each air force and major AAF command is directed to:

1. Establish policies and emergency rescue procedures to implement those established by Headquarters, AAF.

2. Notify the air force commanders responsible for emergency rescue within the area of discontinuance or establishment of installations.

3. Direct all base commanders under his jurisdiction to:

   a. Cooperate to the fullest extent with the requests of the emergency rescue control center.

   b. Report immediately to the appropriate emergency rescue control center information of aircraft or personnel in distress, and report unusual operations which may require special emergency rescue coverage.

   c. Provide service to emergency rescue detachments as established by headquarters.

Within established policies, the commanding general of each numbered air force is responsible for emergency rescue activities in his assigned air force emergency rescue area directed to:

1. Establish policies and e rescue methods in accorda policies and procedures estab Headquarters, AAF.

2. Direct, coordinate and air force emergency rescue are sibilities.

3. Establish emergency re trol centers and assign the a the jurisdiction of each.

4. Establish adequate emer cue facilities in such locations required, utilizing existing whenever practicable; and to and reallocate rescue facili equipment to insure adequ efficient rescue coverage.

5. Submit to Headquarters, quirements for rescue facili equipment, and report any s adequate and efficient rescue

6. Establish liaison and with other air forces or ind AAF commands, and Army, N civilian agencies, to fulfill the emergency rescue.

7. Request assistance from installation within the air for area when the facilities under his established emergency res trol centers are insufficient t plish the assigned mission.

8. Assign emergency rescue and equipment to installations jurisdiction.

Emergency Rescue Control Cente

Within established policy, e rescue control centers will:

1. Determine the location reported rescue incident, di mobile facilities to the surviv vide them with the means for and be responsible for their safety.

2. Establish policies and e rescue procedures to impleme established by higher authorit

3. Keep posted on the av status and condition, and pe post the location of all rescue

ment within the assigned area.
› informed of the capabilities
:ue and communication facili-
ı the area.
blish requirements and ar-
pid communications service
:scue facilities.
nge for the coordination of
agencies not under the direct

incident, plotting periodic position reports of all mobile facilities used on the mission, and disseminating information as directed by higher authority.

9. Determine the abandonment of search when there is no reasonable likelihood that the survivors can be located by further search, and notify all agencies concerned of such action.

to the appropriate emergency rescue control center.

5. Notify emergency rescue control centers of unusual operations which may require special coverage.

FACILITIES AND EQUIPMENT

Existing communication facilities will be utilized to the fullest extent.

EMERGENCY RESCUE AREAS ASSIGNED TO NUMBERED AIR FORCES

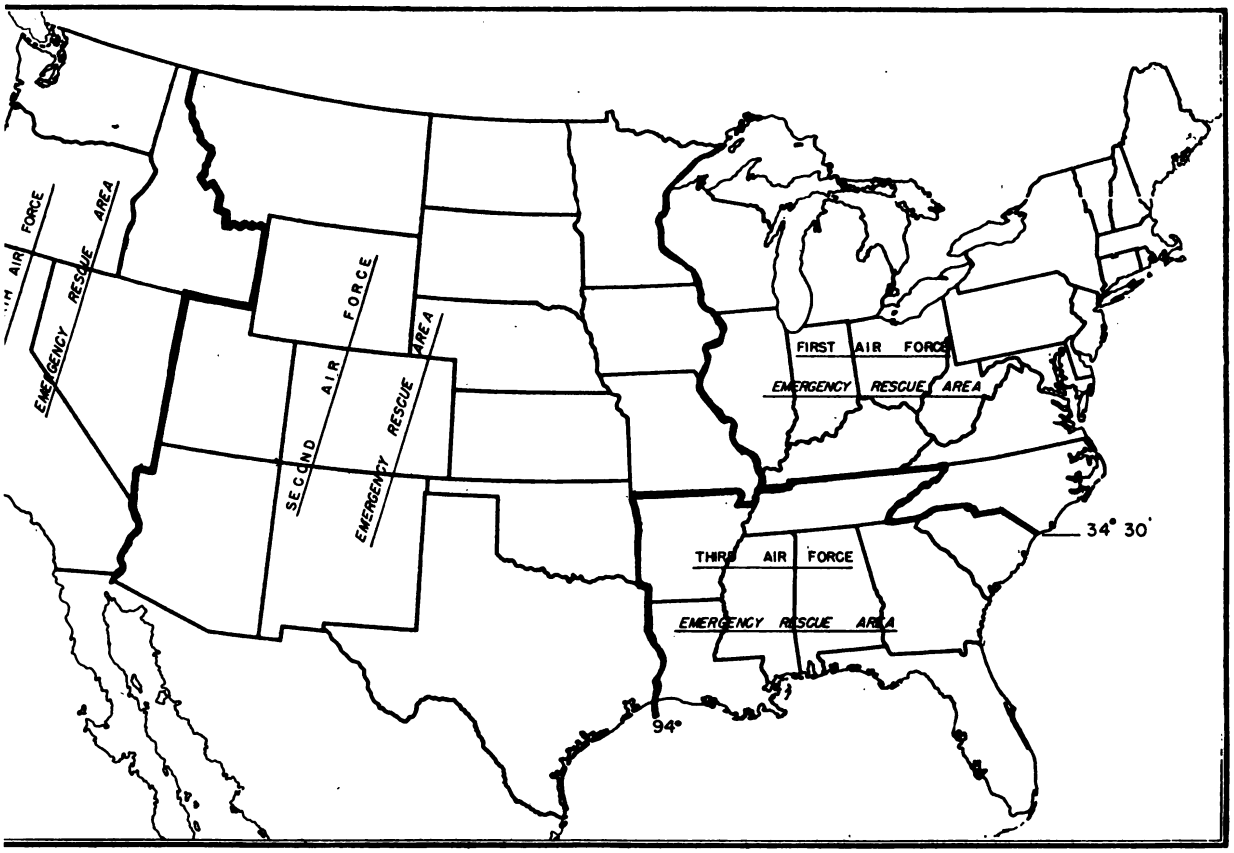


Figure 1

f the emergency rescue control

uest any AAF organization
ıe assigned area for assistance
the rescue facilities under the
e control of the emergency
ntrol center are insufficient to
:h the assigned mission.
eive, evaluate and disseminate
ss information promptly, and
:scue action when necessary.
:d in this will be: the opera-
›ntrol of all rescue facilities
to the control center; directing
f other rescue facilities as re-
:oordinating activities of the
:enter with other emergency
ntrol centers whenever neces-
ıntaining a running log of each

Air Force Bases

All AAF base commanders are directed to:

1. Assist in emergency rescue operations as requested by the area emergency rescue control center.

2. Make available, upon request of emergency rescue control center, facilities, equipment and personnel under their jurisdiction, as may be required for the assistance of lost aircraft or distressed personnel.

3. Initiate action in accordance with AAF Reg. 62–14 and standing operating procedure established by higher authority.

4. Immediately report any information of aircraft or personnel in distress

Base equipment, land and marine, required for crash rescue purposes on or in the immediate vicinity of an AAF base will continue to be assigned to the base.

THAWING MORPHINE SYRETTES BY PLACING IN THE MOUTH

Morphine in a first-aid syrette will freeze in sub-zero temperatures but can be thawed easily by placing the syrette in the mouth for a few minutes. This observation is reported in the 1943–44 "Cold Weather Trials Report" to the Department of National Defense, Canada. (AIR SURGEON'S BULLETIN, February 1945.)

DISTRESS SMOKE HAND SIGNAL

Will Be Incorporated In Life Vest Equipment

AN STANDARDIZATION APPROVED

Navy BuOrd has published a circular letter (AV24–44) to acquaint ship and shore activities with the newly adopted Distress Smoke Hand Signal, AN—Mark 1, Modification O. Instructions are included to cover issue and use in naval aircraft life rafts and droppable gear. Designed primarily for distress signaling, this hand signal is similar in purpose to the Grenade, Smoke Hand (HC), AN–M–8, which it replaces in the ratio of four hand signals to one grenade.

The signal contains a pyrotechnic mixture which, when ignited, produces a volume of orange smoke for approximately 18 seconds. The signal itself is encased in a metal cylinder body (3 and ⅞ inches in length and 1 and ⅝ inches in diameter), one end of which is closed by a soldered cap with pull ring which is of proper size to allow insertion of the index finger when the signal is to be fired. Being watertight, the signal is not adversely affected by moisture, and is so constructed that it can be comfortably and safely held in the bare hand during the burning period. Illustrated instructions for proper firing are printed on the colored label of each signal.

This signal is now available to the activities on a priority basis and has been standardized by the Army and Navy. Packed 100 per wooden shipping case, with a gross weight of 50 pounds, the signals should be stowed in a cool, dry place; in no case at a temperature higher than 100° Fahrenheit.

In view of the effectiveness and relative safety of the signal, the Naval Auxiliary Air Station, Mayport, Fla., has incorporated it with the equ carried on the ANA Spec. AN–V vest to provide airmen with a signal on their person for use if down. Favorable comment fro Florida-based squadrons which this modification has led BuAer pare a technical note describi installation procedure. TN No outlines the following instructi attaching the rubberized fabric into which the signals are fitted

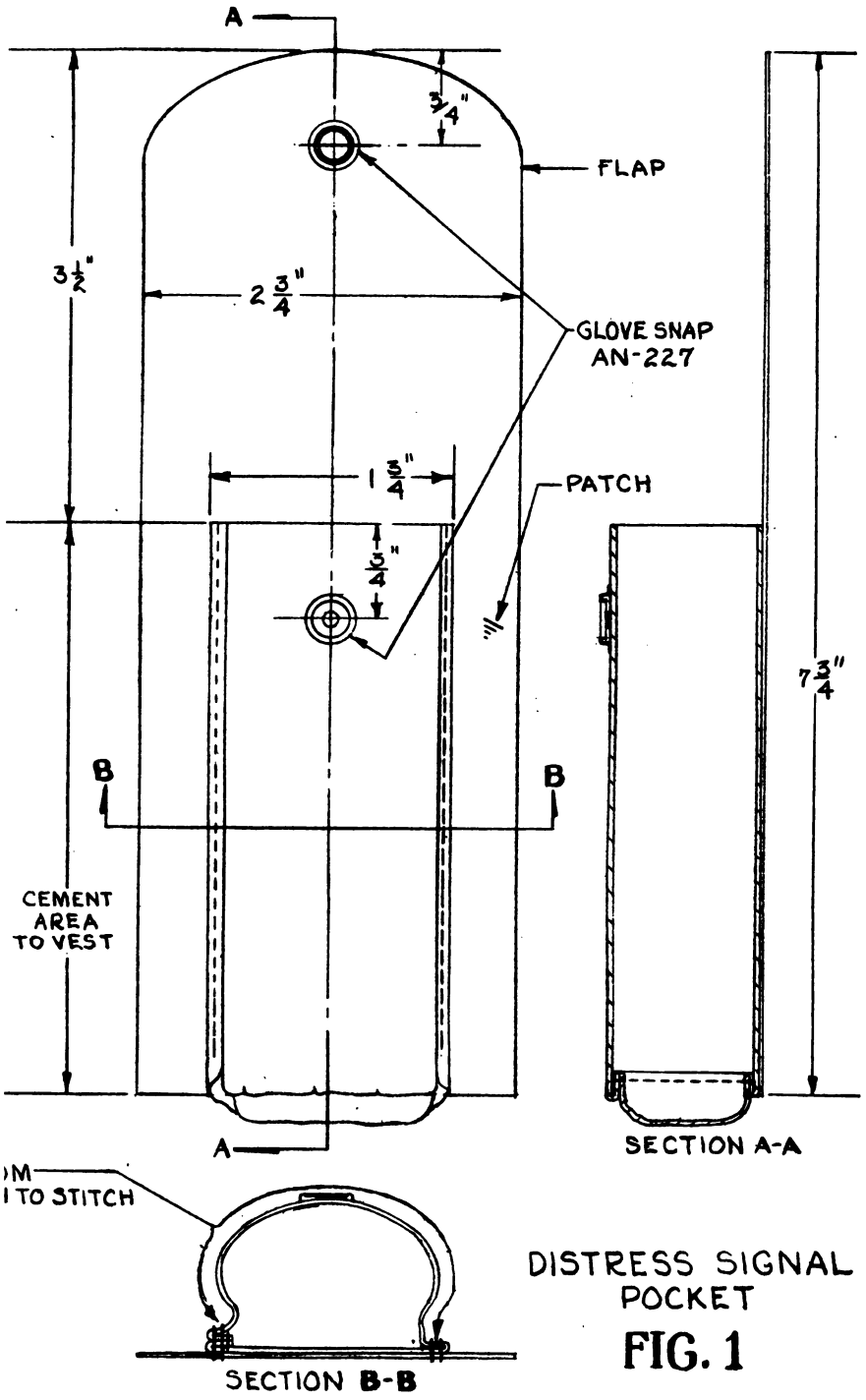
Figure 1 (next page) shows .tl struction details of the pockets pockets should be stitched to a ized fabric patch, which in turn be cemented to the vest at a l opposite the inflation cylind shown in figures 2, 3 and 4 (next Any of the following types of may be used for the pockets and es: Spec. AN–F–10, Types C, K; NavAer Spec. F–28, Type O

The proper cementing proced attaching the pockets to the ves

1. Clean with carbon tetrachl other suitable safety solvent b patch and the area on the vest t the patch is to be applied.

2. Roughen the patch with brush or other roughening tool.

3. Apply four thin coats of Spec. AN–C–54, Type B, to b patch and the vest, allowing ea to dry for not less than five minu more than 15 minutes. The fi



DISTRESS SIGNAL POCKET

FIG. 1

Figure 2

Figure 3

Figure 4

s should be brushed well into the ic; the last two coats should be ied evenly.

After the last coat has dried, apply patch to the vest, making certain no wrinkles result in the application. Roll down the patch, using a metal or rubber roller, to assure proper adhesion.

5. Do not exert any pressure on the patch until at least four hours after joining.

PYROTECHNICS FOR USE IN AIR-SEA RESCUE

A Summary of Signals And Signaling Devices Adaptable For Use By Airmen In Emergencies Has Been Compiled

DEPTH CHARGE MARKER, NIGHT, MARK 2 (NAVY)

This signal is a calcium carbide, calcium phosphide, water actuated, floating light, which emits a flame of about 9 inches and burns for 45 to 55 minutes.

It is similar to the RES-Q-LITE and the SAVE-U-LITE. This signal is not recommended for use during wartime or at any time on tank vessels, as the flame emitted will ignite inflammable liquids floating on the surface of the water.

The visibility of the Depth Charge Marker is reported to be four miles from a ship's deck and 10 miles from aircraft.

AIRCRAFT PARACHUTE SIGNAL, RED STAR, M11 (ARMY AND NAVY)

This signal has been the standard distress signal of the Army Air Forces for some time, and is similar to the Signal Cartridge—Parachute, approved by the Coast Guard for merchant vessels. The AAF has installed it in all of the aircraft life rafts and emergency droppable gear. However, it will be replaced in the near future with Distress Signal, Two Star, Red, M75. The M11 is parachute supported and produces a red light of 20,000 candle power intensity for a period of 30 seconds while falling at a rate of six feet a second.

This signal is visible for seven to eight miles from a ship's deck, and up to 20 miles from aircraft.

SIGNAL AIRCRAFT, SINGLE STAR, RED, AN-M43 (ARMY AND NAVY)

A single star of 25,000 candle power, this signal has a burning time of seven seconds on a rise of 250 feet. *It is reported to be visible at 10 miles; however, it should be visible as far as the Aircraft Parachute Signal, Red Star, M11.*

VERY'S SIGNAL LIGHT, MARK II ALL SERVICES)

The standard distress signal for all services for a long time, this signal is made in red, green and white colors. The red color is used for distress signaling. The red star is of 300 candle power. *It has been reported that the maximum reliable visibility is one mile; however, reports from the Pacific area indicate that the signal has been sighted up to seven miles.*

HAND GRENADE, HC WHITE SMOKE, AN-M8 (ARMY AND NAVY)

This grenade produces a dense cloud of white smoke for a period of 2½ to 3 minutes and has been *reported to be visible up to 7 miles.* Pending replacement by the AN—Mark 1, Mod. 1, the HC, AN-M8, is recommended as a distress signal even though the smoke blends into the background—gra clouds and white caps on the which under certain wind and s ditions makes observation of the difficult.

GRENADE, SMOKE, COLOREI (ARMY)

This signal is identical with t White Smoke Grenade, AN-M8, for the color of the smoke. produced in the following colo yellow, green, orange, violet and

The red, yellow and orange are *reported to be visible up t miles.*

GRENADE, SMOKE, COLOREI (ARMY)

Identical with the HC White Grenade, AN-M8, except that duces the same color smoke as tl this signal burns for one minu produces a more dense cloud of due to the shorter burning time.

DISTRESS HAND SMOKE SI AN—MARK 1, MOD 0

This signal is a small ha smoke signal, which emits a cloud of fire-orange smoke for a of 18 seconds. *It is reported tc ible up to 7 miles.* It is place naval aircraft life rafts and dr rescue gear.

HAND PYROTECHNIC PI TORS, MARK 3 AND M/ (NAVY)

These projectors are designed the Very Signal Light, Mark II. are installed in the ship's Aband Kit, all naval aircraft life raf droppable rescue gear. They ar 5½ inches over-all length. Th 3 screws together at the breech the Mark 4 has a bayonet con

(Continued on next page)

Avoid Use of Float Lights in Vicinity of High-Octane Gas

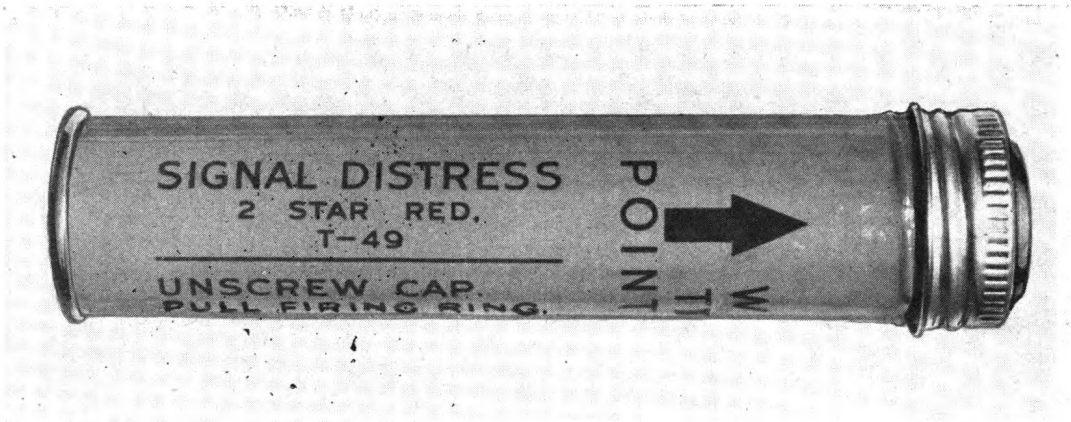
An ASRU Memorandum of the Northern Sector, Western Sea Frontier, cautions pilots about dropping float lights at the scene of a wreck in the vicinity of high-octane gasoline. Internal Memorandum No. 6-45 points out that float lights are pyrotechnic, that promiscuous use should be avoided and that they should be handled with care.

"It is possible," the memorandum continues, "that unless extreme care is used the dropping of a float light may cause the loss of the potential survivors and of our own crash boats. In a recent case, the crash boats were preceeding with caution, all hatches secured, and the smoking lamp out due to high-octane gasoline in the water and severe gas fumes. Into all this an airborne rescue craft had the temerity to drop a float light which fortunately did not ignite the gasoline."

Information as to the effect of pyrotechnics on floating gasoline is being compiled, but meanwhile the memorandum urges pilots to use extreme caution:

- **In dropping float lights where there is absolutely no need for them.**
- **If necessary, then drop them upwind and clear of the crash slick.**
- **Use of dye-marker is an alternative in an operation of this kind.**

ARMY ADOPTS NEW HAND-HELD RED DISTRESS SIGNAL



;ract attention under emergency ns at night and to aid in rescu- ned personnel, the Army re- adopted a new hand-held red signal. Designated as Distress Two Star Red, M75, this cylin- shaped signal (1⅛ by 5 inches, 6 ounces) emits two red stars noot to an approximate height feet. The burning time is 5.2 seconds with approximately 13,380 candle power.

Packed 10 to a carton, 10 cartons to a wooden shipping case, this signal (Stock No. S005–90–28015, Spec. No. AXS 1419) is available at the present time on a priority basis only, but with increased production will become available to the field.

It is reported that the visibility is five miles in daylight and 12 miles plus at night. (It is believed that the daylight visibility is less than reported.)

The Army is placing several of the M75 signals in the airborne lifeboat, and four in the C–2 one-man life raft.

The Navy has procured 20,000 of these signals, which are on their way to the fleet.

)TECHNICS *(Continued)*

PISTOL, 10-GAGE, MARK III MY) MARK 3 (NAVY)

ires only the Very's Signal Light, I. It was the standard signal or some time in the military out became obsolescent due to control of critical materials. re still in use. It has a steel nd brass receiver, is 12⅛ inches l weighs about 2½ pounds.

PISTOL, 10-GAGE, MARK 5 AVY)

pistol is a substitute for the Very pistol in the Navy. It is ith an aluminum-alloy barrel rd fiber receiver and grip. It is nes in over-all length and weighs ½ pounds.

PISTOL, 10-GAGE, M5 MY)

pistol has replaced the Mark III stol in the Army. It is lighter nt and smaller than other types pistols.

PYROTECHNIC PISTOL, M2 (ARMY AND NAVY)

This pistol is obsolescent for aircraft use and has been replaced with the Pyrotechnic Pistol, AN–M8.

PYROTECHNIC PISTOL AN–M8 (ARMY AND NAVY)

This pistol is the standard pyrotechnic pistol for the Army and Navy for aircraft use.

It is capable of firing all so-called 1½-inch signals now in service. The Signal Cartridge approved by the Coast Guard for merchant vessels has been fired from it with the same results as when fired from the approved pistol for merchant vessels.

HAND PYROTECHNIC PROJECTOR, M9 (ARMY)

This projector is at present standard equipment for latest Army life rafts. It is made of steel, is 8 inches long and weighs one pound.

EMERGENCY SIGNALING MIRRORS

Three types of signal mirrors are now in service. The standard signaling mirror used by the Naval Air Force is the Learned type, which is easy to aim, due to the oval retrodirective reflector aiming device attached to the center of the mirror. It is the best of the signaling mirrors in use.

The Army Air Forces use the General Electric type signaling mirror, which is difficult to aim under rough sea conditions.

Both the Learned and the General Electric mirrors are made of tempered glass.

The approved signal mirror for the Merchant Marine is made of stainless steel, polished on both sides. Difficulty is encountered in aiming it under rough sea conditions.

SEA DYE MARKER

There are two dye markers now in service which are used by distressed seamen and downed airmen to attract the attention of searching aircraft and

(Continued on page 16)

PARARAFT KIT—PK 1

Airmen Carry New Navy Pack Which Has Been Designed to Replace Back Pad Greater Freedom and Comfort and Reduction in Weight Listed Among Its Advant

A study of survival reports and comments of service personnel indicated that the present Back Pad Kit, Stock No. R83–K–520100 (NavAer Spec. No. M–592), was uncomfortable and placed the pilot too far from the protective armor plate at his back. To eliminate this condition, the Bureau of Aeronautics developed and has initiated procurement of a Pararaft Kit*, Model PK–1 (Spec. No. M–641), which will enable the user to sit on all his gear, if desirable, instead of carrying it on his back.

This will result in relief from the weight of the back pad kit, allow greater freedom of movement and provide increased protection to the wearer. The pararaft kit, now in production, is expected to be ready for delivery in limited quantities to the operating forces commencing approximately the first of May.

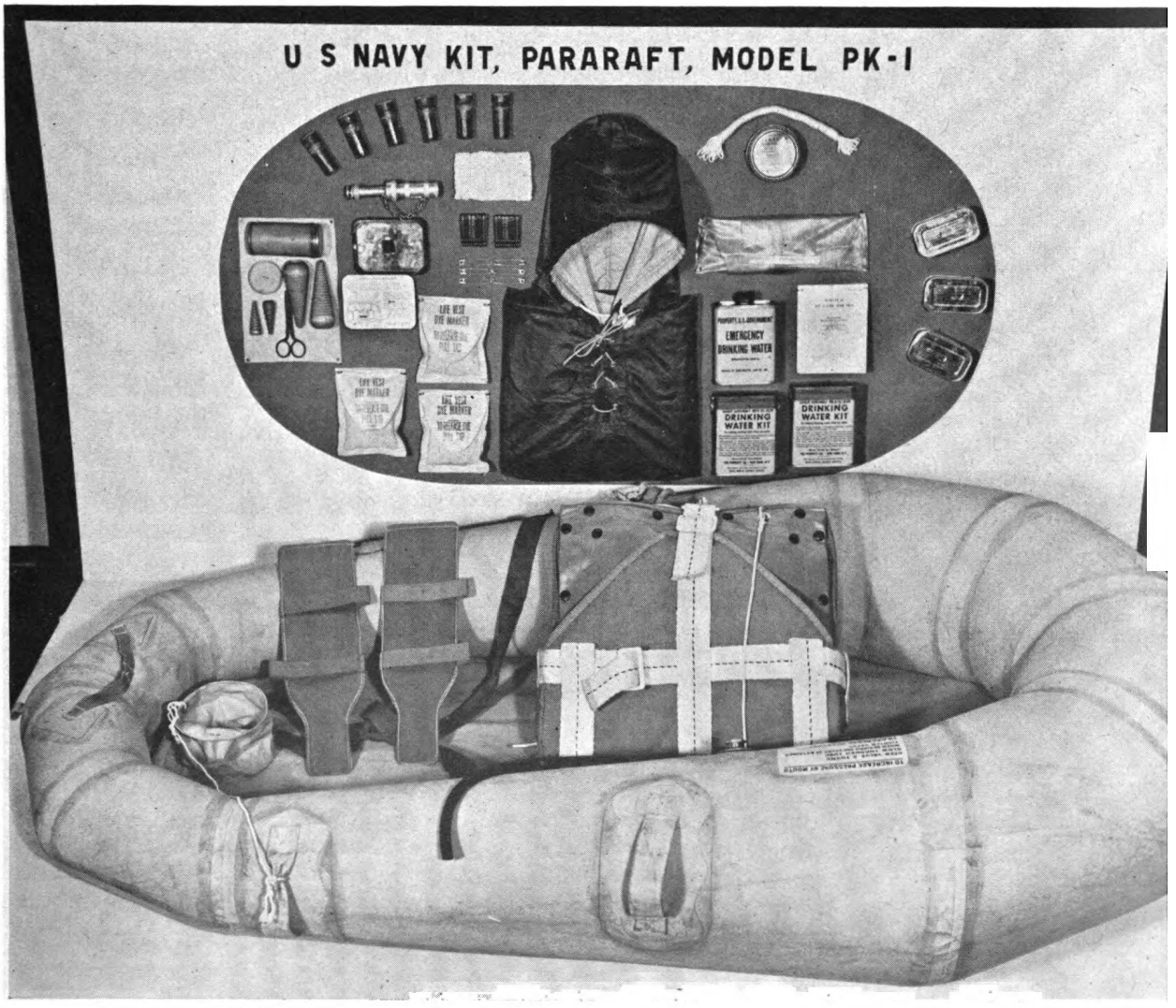
The pararaft kit is intended to be worn by pilots and other flight personnel flying over water. Each kit consists of a pararaft, emergency sustenance equipment, a case for stowing the raft and equipment, and a container which provides means of attaching the raft and equipment to the parachute harness.

*See Technical Orders Nos. 9–45 and 24–45.

STRUCTURAL IMPROVEM

Differing in several respects one-man life rafts of the series, the pararaft included in t assembly is lighter in weight stowed in a smaller space a radar corner reflector holder. tenance equipment is similar furnished in the back pad kit; new and improved items ar Differences are noted in the lis tents, which is appended at th this article.

The pararaft case has two ments, one for the raft and the the sustenance equipment. I



EQUIPMENT AND FACILITIES

he AN–R–2 series seat packs
ıtly thicker. The compart-
he raft is smaller, allowing
be folded quite compactly
stowage in the case. The
nt containing the raft is
ı a snap fastener, and that
s the emergency sustenance
is secured by means of a
slide fastener.
release snap, which enables
break out his raft and equip-
a minimum of difficulty, is
n the pararaft kit container.
iner can be used interchange-
standard seat, quick attach-
quick attachable chest and
ack type parachutes. Rein-
ı heavy webbing, this assem-
ithstand the greater stresses
hen wearers make exits from
ıveling at high speeds, and
type parachute the container
l to the harness and not the
ıs the parachute harness
e strain when the parachute

tainer with the quick-release
es the pararaft kit easily
from the parachute and
ı preparation for ditching;
his operation was difficult.

TERIM CONTAINER

ıterim measure until the kits
ble, BuAer developed a case

PK-1 KIT AND ACCESSORIES

Item	Quantity	Stock No.	Specification No.	Class No.
Model PK–1; Pararaft Kit complete		R83–K–709965	M–641	83
Anchor, Sea	[1] 1	C. F. E	M–641	None
Bailing Sponge, Type 2, Size 4	[2] 1	R83–B–648500	L–S–626	83
Case, Model PK–1; Pararaft Kit	1	C. F. E	Dr. No. 9216	None
Container, Model PK–1; Pararaft Kit	1	C. F. E	Dr. No. 9218	None
Cylinder Valve Assembly	1	R83–C–94670	M–641, E–11	None
Drinking Water (Flat Cans)	1	R51–W–145	AN–W–5B	51
Drinking Water Kit, Chemical	[2] 2	R83–K–511000	M–613	83
Leak Plugs	4	R83–P–408550	M–641, E–3a (6)	83
Line, Nylon, Type 1, 150′ coil	[1] 1	C. F. E	AN–C–63	None
Match, Safety, Book	[2] 2	C. F. E	None	None
Oral Inflation Tube	1	R83–T–704150	M–641, E–1K	83
Paddles, Hand, 14 by 4 inches	2	R83–P–4800	M–641, E–1L	83
Poncho	[1] 1	C. F. E	Dr. No. 9217	None
Pyrotechnic Projector Kit	1	R83–K–710309	BuOrd	83
Rations, Tablet	3	R56–R–6300	M–539B	56
Reflector, Radar, Corner	[2] 1	C. F. E	MX–137/A	None
Repair Kit	[1] 1	R83–K–710165	M–641, E3a (7)	83
2 4-inch diameter tire patches 3 2-inch diameter tire patches 2 ounces rubber cement				
Safety Pins, 2-inch	6	C. F. E	None	None
Sea Marker, Life Jacket Packet	3	R37–P–25	M–566	37
Signaling Mirror	[1] 1	R83–M–525525	M–580A	83
Sunburn Ointment, 3-ounce can	1	R57–O–100	Pt. No. P–40469	57
Survival Booklet	[2] 1	C. F. E	None	None
Water Storage Bag (Plastic) 5-quart	[2] 1	R83–B–30175	Dr. No. 8985	83

[1] Item improved over similar equipment found in Back Pad Kit or AN–R–2 series seat packs.
[2] New item not included before as standard equipment in 1-man kit assemblies.

which will combine the contents of the back pad kit and the one-man parachute type life raft. (Spec. No. AN–R–2*.) This container, which is catalogued as Case, Pararaft and Equipment Container, Model A (Stock No. R83–C–8670), is approximately 15 by 15 by 5 inches and is divided horizontally into two compartments. The pararaft is inserted into the upper compartment and the cover is secured by a snap fastener. Certain items of sustenance equipment are to be removed from the back pad kit and inserted in the lower compartment, which is closed by means of a heavy-duty slide fastener. Twenty thousand of these Model A pararaft and equipment containers have been procured, and deliveries are scheduled to be completed by the middle of May.

*See Technical Order 9–45.

TECHNICS

(Continued from page 14)

)ne is designed to tie onto the
ife vest, or life preservers of
e type. It is carried in all
e rafts and droppable rescue
e fluorescein dye is contained
ed, waterproof fabric pouch.
d dye marker is designed to be
boats and rafts on vessels. It
ed in a round or rectangular
ı, sealed with a snap-on bottle
crew-on cap.
f these dye markers contain
uorescein dye to produce a
on the surface of the water,
mally persists for a period of
ıinutes.
dye marker used by the
indicate the initial point of
ith submarines is the Depth Charge Marker, Day, Mark 1, Mod. 1. It was designed to provide a reference point for further search and attack during day operations. The marker consists of a circular wooden block on which is mounted a grenade-firing mechanism. Fluorescein dye is contained in two cylindrical paper cans, one attached to each side of the wooden block. A celluloid tube extending through the wooden block into both the paper cans contains the bursting charge of black powder. When the marker is launched there is a 15-second delay before the bursting charge is ignited. The slick produced persists for approximately 45 minutes.

The visibility of the above dye marker is approximately 3,000 yards from the deck of a vessel and up to 5 miles from aircraft.

HEATED CASUALTY BAG FOR EIGHTH AIR FORCE

An electrically heated casualty bag for protection of wounded crew members at high altitudes has been developed by the Eighth Air Force. The bag maintains normal body temperature and permits injured personnel to be freed of tight clothing and properly bandaged without danger of exposing parts of the body to frostbite. Strap handles on each side facilitate lifting the patient and carrying him from the plane without unnecessary jostling and without use of a litter. The bag is buoyant and can float a 190-pound man in the water if the plane has to be ditched on its return from a mission. (AIR FORCE, January, 1945.)

QUICK DONNING EXPOSURE SUIT

MARK I DEVELOPED BY NAVY FOR AVIATION PERSONN

There has long been a need for an adequate exposure suit to protect fliers who are downed in the colder waters of the world. The Mark I Quick Donning Exposure Suit for aviation personnel has been developed by the Navy to meet such contingencies.

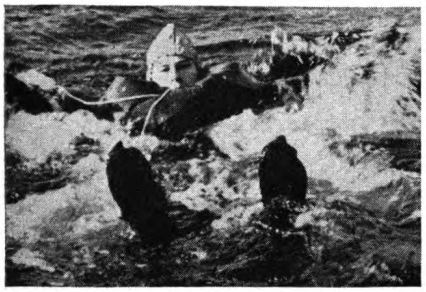


FIG. 2

Description, purpose and operation of the suit (NavAer Spec. No. M–680) is outlined in Technical Note No. 7–45.

The exposure suit (ASO Stock No. R37–S–5332) is a single piece cover-all type suit with attached hood which completely envelopes the body, limbs, and head of the wearer (fig. 1). Quick and positive closure is afforded by a neck drawstring. It is constructed of a lightweight waterproof material and is designed for donning immediately before, or subsequent to, crash landings at sea.

In addition to affording protection from spray, water, etc., the suit when worn over winter flight gear affords a high degree of buoyancy when the wearer is in the water (fig. 2). The suit is supplied in a convenient carrying pouch in one size only and is equipped with two NavAer Spec. M–566 sea dye marker packets attached externally.

The purpose of the suit is to provide protection from immersion in cold waters and exposure to wind, rain or spray when aboard a life raft. If the wearer should become immersed before donning the exposure suit, it will still afford protection if put on immediately after boarding the raft because of the reduction in body heat loss due to the chilling effect of the wind.

The suit is removed from its carrying bag, unrolled and the wearer steps into it through the wide neck. It is pulled up, the arms inserted, the wrist bands adjusted, and the hood placed over the head. The small beads at the end of the drawstring are grasped and the drawstring pulled to within about 6 inches of the neck. The ankle straps should be adjusted so that if a man is small, the legs will not sag down under the wearer's feet. After both leg straps are adjusted,

FIG. 1

the greater portion of the should be vented out thr opening; then the drawstr be pulled up securely ag

It is recommended th sible, entry be made into first. As the suit is wor vest, it will be found eas toggles before jumping i or if in the water, when fl back. In spite of the buo by the suit, the pulling should not be overlooke

The exposure suit is i used in the waters in following areas:

			November thro April
North Atlantic Area:			
East } West }	Above	Lat. 3(Lat. 3	
South Atlantic Area:			
East } West }	Below	Lat. 3 Lat. 3	
North Pacific Area:			
East } West }	Above	Lat. 2 Lat. 3	
South Pacific Area:			
East } West }	Below	Lat. 3(Lat. 3	

Allotment to operating on the following basis:

1. One unit per crew me pilot and co-pilot) of al airplanes and airships ope areas. This includes Co Marine squadrons and all passengers on NATS flig

2. All carriers operat areas on a basis of 30 eac

(Continued on next

642936—45——3

he AN–R–2 series seat packs
htly thicker. The compart-
the raft is smaller, allowing
be folded quite compactly
stowage in the case. The
nt containing the raft is
h a snap fastener, and that
ls the emergency sustenance
is secured by means of a
slide fastener.
-release snap, which enables
break out his raft and equip-
a minimum of difficulty, is
n the pararaft kit container.
iner can be used interchange-
standard seat, quick attach-
quick attachable chest and
ack type parachutes. Rein-
heavy webbing, this assem-
withstand the greater stresses
hen wearers make exits from
aveling at high speeds, and
type parachute the container
l to the harness and not the
is the parachute harness
e strain when the parachute

tainer with the quick-release
es the pararaft kit easily
from the parachute and
preparation for ditching;
his operation was difficult.

TERIM CONTAINER

nterim measure until the kits
ble, BuAer developed a case

PK-1 KIT AND ACCESSORIES

Item	Quantity	Stock No.	Specification No.	Class No.
Model PK–1; Pararaft Kit complete		R83–K–709965	M–641	83
Anchor, Sea	[1] 1	C. F. E	M–641	None
Bailing Sponge, Type 2, Size 4	[2] 1	R83–B–648500	L–S–626	83
Case, Model PK–1; Pararaft Kit	1	C. F. E	Dr. No. 9216	None
Container, Model PK–1; Pararaft Kit	1	C. F. E	Dr. No. 9218	None
Cylinder Valve Assembly	1	R83–C–94670	M–641, E–11	None
Drinking Water (Flat Cans)	1	R51–W–145	AN–W–5B	51
Drinking Water Kit, Chemical	[2] 2	R83–K–511000	M–613	83
Leak Plugs	4	R83–P–408550	M–641, E–3a (6)	83
Line, Nylon, Type 1, 150′ coil	[1] 1	C. F. E	AN–C–63	None
Match, Safety, Book	[2] 2	C. F. E	None	None
Oral Inflation Tube	1	R83–T–704150	M–641, E–1K	83
Paddles, Hand, 14 by 4 inches	2	R83–P–4800	M–641, E–1L	83
Poncho	[1] 1	C. F. E	Dr. No. 9217	None
Pyrotechnic Projector Kit	1	R83–K–710309	BuOrd	83
Rations, Tablet	3	R56–R–6300	M–539B	56
Reflector, Radar, Corner	[2] 1	C. F. E	MX–137/A	None
Repair Kit 2 4-inch diameter tire patches 3 2-inch diameter tire patches 2 ounces rubber cement	[1] 1	R83–K–710165	M–641, E3a (7)	83
Safety Pins, 2-inch	6	C. F. E	None	None
Sea Marker, Life Jacket Packet	3	R37–P–25	M–566	37
Signaling Mirror	[1] 1	R83–M–525525	M–580A	83
Sunburn Ointment, 3-ounce can	1	R57–O–100	Pt. No. P–40469	57
Survival Booklet	[2] 1	C. F. E	None	None
Water Storage Bag (Plastic) 5-quart	[2] 1	R83–B–30175	Dr. No. 8985	83

[1] Item improved over similar equipment found in Back Pad Kit or AN–R–2 series seat packs.
[2] New item not included before as standard equipment in 1-man kit assemblies.

which will combine the contents of the back pad kit and the one-man parachute type life raft. (Spec. No. AN–R–2*.) This container, which is catalogued as Case, Pararaft and Equipment Container, Model A (Stock No. R83–C–8670), is approximately 15 by 15 by 5 inches and is divided horizontally into two compartments. The pararaft is inserted into the upper compartment and the cover is secured by a snap fastener. Certain items of sustenance equipment are to be removed from the back pad kit and inserted in the lower compartment, which is closed by means of a heavy-duty slide fastener. Twenty thousand of these Model A pararaft and equipment containers have been procured, and deliveries are scheduled to be completed by the middle of May.

*See Technical Order 9–45.

TECHNICS

(Continued from page 14)

One is designed to tie onto the
life vest, or life preservers of
ie type. It is carried in all
e rafts and droppable rescue
e fluorescein dye is contained
ed, waterproof fabric pouch.
d dye marker is designed to be
boats and rafts on vessels. It
ed in a round or rectangular
n, sealed with a snap-on bottle
crew-on cap.
f these dye markers contain
uorescein dye to produce a
on the surface of the water,
mally persists for a period of
inutes.
dye marker used by the
indicate the initial point of
ith submarines is the Depth Charge Marker, Day, Mark 1, Mod. 1. It was designed to provide a reference point for further search and attack during day operations. The marker consists of a circular wooden block on which is mounted a grenade-firing mechanism. Fluorescein dye is contained in two cylindrical paper cans, one attached to each side of the wooden block. A celluloid tube extending through the wooden block into both the paper cans contains the bursting charge of black powder. When the marker is launched there is a 15-second delay before the bursting charge is ignited. The slick produced persists for approximately 45 minutes.

The visibility of the above dye marker is approximately 3,000 yards from the deck of a vessel and up to 5 miles from aircraft.

HEATED CASUALTY BAG FOR EIGHTH AIR FORCE

An electrically heated casualty bag for protection of wounded crew members at high altitudes has been developed by the Eighth Air Force. The bag maintains normal body temperature and permits injured personnel to be freed of tight clothing and properly bandaged without danger of exposing parts of the body to frostbite. Strap handles on each side facilitate lifting the patient and carrying him from the plane without unnecessary jostling and without use of a litter. The bag is buoyant and can float a 190-pound man in the water if the plane has to be ditched on its return from a mission. (AIR FORCE, January, 1945.)

QUICK DONNING EXPOSURE SUIT

MARK I DEVELOPED BY NAVY FOR AVIATION PERSONN

There has long been a need for an adequate exposure suit to protect fliers who are downed in the colder waters of the world. The Mark I Quick Donning Exposure Suit for aviation personnel has been developed by the Navy to meet such contingencies.

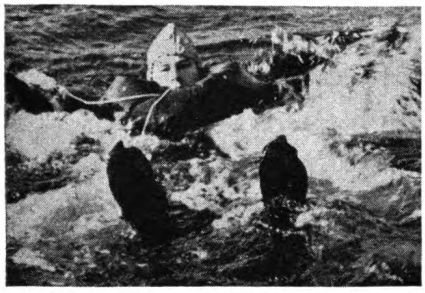


FIG. 2

Description, purpose and operation of the suit (NavAer Spec. No. M–680) is outlined in Technical Note No. 7–45.

The exposure suit (ASO Stock No. R37–S–5332) is a single piece cover-all type suit with attached hood which completely envelopes the body, limbs, and head of the wearer (fig. 1). Quick and positive closure is afforded by a neck drawstring. It is constructed of a lightweight waterproof material and is designed for donning immediately before, or subsequent to, crash landings at sea.

In addition to affording protection from spray, water, etc., the suit when worn over winter flight gear affords a high degree of buoyancy when the wearer is in the water (fig. 2). The suit is supplied in a convenient carrying pouch in one size only and is equipped with two NavAer Spec. M–566 sea dye marker packets attached externally.

The purpose of the suit is to provide protection from immersion in cold waters and exposure to wind, rain or spray when aboard a life raft. If the wearer should become immersed before donning the exposure suit, it will still afford protection if put on immediately after boarding the raft because of the reduction in body heat loss due to the chilling effect of the wind.

The suit is removed from its carrying bag, unrolled and the wearer steps into it through the wide neck. It is pulled up, the arms inserted, the wrist bands adjusted, and the hood placed over the head. The small beads at the end of the drawstring are grasped and the drawstring pulled to within about 6 inches of the neck. The ankle straps should be adjusted so that if a man is small, the legs will not sag down under the wearer's feet. After both leg straps are adjusted,

FIG. 1

the greater portion of th should be vented out th opening; then the drawst be pulled up securely ag

It is recommended tl sible, entry be made intc first. As the suit is wo vest, it will be found ea toggles before jumping i or if in the water, when fl back. In spite of the buc by the suit, the pulling should not be overlooke

The exposure suit is used in the waters in following areas:

		November thro April
North Atlantic Area:		
East } West }	Above	Lat. 3 Lat. 3
South Atlantic Area:		
East } West }	Below	Lat. 3 Lat. 3
North Pacific Area:		
East } West }	Above	Lat. Lat.
South Pacific Area:		
East } West }	Below	Lat. 3 Lat. 3

Allotment to operatin on the following basis:

1. One unit per crew me pilot and co-pilot) of a airplanes and airships ope areas. This includes Cc Marine squadrons and al passengers on NATS flig

2. All carriers opera areas on a basis of 30 ea

(Continued on nex

642936—45——3

he AN–R–2 series seat packs
htly thicker. The compart-
he raft is smaller, allowing
be folded quite compactly
stowage in the case. The
nt containing the raft is
a snap fastener, and that
s the emergency sustenance
is secured by means of a
slide fastener.
release snap, which enables
break out his raft and equip-
a minimum of difficulty, is
n the pararaft kit container.
iner can be used interchange-
standard seat, quick attach-
quick attachable chest and
ack type parachutes. Rein-
heavy webbing, this assem-
ithstand the greater stresses
hen wearers make exits from
aveling at high speeds, and
type parachute the container
to the harness and not the
is the parachute harness
e strain when the parachute

tainer with the quick-release
es the pararaft kit easily
from the parachute and
preparation for ditching;
his operation was difficult.

TERIM CONTAINER

terim measure until the kits
ble, BuAer developed a case

PK-1 KIT AND ACCESSORIES

Item	Quantity	Stock No.	Specification No.	Class No.
Model PK-1; Pararaft Kit complete		R83-K-709965	M-641	83
Anchor, Sea	[1] 1	C. F. E	M-641	None
Bailing Sponge, Type 2, Size 4	[2] 1	R83-B-648500	L-S-626	83
Case, Model PK-1; Pararaft Kit	1	C. F. E	Dr. No. 9216	None
Container, Model PK-1; Pararaft Kit	1	C. F. E	Dr. No. 9218	None
Cylinder Valve Assembly	1	R83-C-94670	M-641, E-11	None
Drinking Water (Flat Cans)	1	R51-W-145	AN-W-5B	51
Drinking Water Kit, Chemical	[2] 2	R83-K-511000	M-613	83
Leak Plugs	4	R83-P-408550	M-641, E-3a (6)	83
Line, Nylon, Type 1, 150' coil	[1] 1	C. F. E	AN-C-63	None
Match, Safety, Book	[2] 2	C. F. E	None	None
Oral Inflation Tube	1	R83-T-704150	M-641, E-1K	83
Paddles, Hand, 14 by 4 inches	2	R83-P-4800	M-641, E-1L	83
Poncho	[1] 1	C. F. E	Dr. No. 9217	None
Pyrotechnic Projector Kit	1	R83-K-710309	BuOrd	83
Rations, Tablet	3	R56-R-6300	M-539B	56
Reflector, Radar, Corner	[2] 1	C. F. E	MX-137/A	None
Repair Kit	[1] 1	R83-K-710165	M-641, E3a (7)	83
2 4-inch diameter tire patches 3 2-inch diameter tire patches 2 ounces rubber cement				
Safety Pins, 2-inch	6	C. F. E	None	None
Sea Marker, Life Jacket Packet	3	R37-P-25	M-566	37
Signaling Mirror	[1] 1	R83-M-525525	M-580A	83
Sunburn Ointment, 3-ounce can	1	R57-O-100	Pt. No. P-40469	57
Survival Booklet	[2] 1	C. F. E	None	None
Water Storage Bag (Plastic) 5-quart	[2] 1	R83-B-30175	Dr. No. 8985	83

[1] Item improved over similar equipment found in Back Pad Kit or AN–R–2 series seat packs.
[2] New item not included before as standard equipment in 1-man kit assemblies.

which will combine the contents of the back pad kit and the one-man parachute type life raft. (Spec. No. AN–R–2*.) This container, which is catalogued as Case, Pararaft and Equipment Container, Model A (Stock No. R83–C–8670), is approximately 15 by 15 by 5 inches and is divided horizontally into two compartments. The pararaft is inserted into the upper compartment and the cover is secured by a snap fastener. Certain items of sustenance equipment are to be removed from the back pad kit and inserted in the lower compartment, which is closed by means of a heavy-duty slide fastener. Twenty thousand of these Model A pararaft and equipment containers have been procured, and deliveries are scheduled to be completed by the middle of May.

*See Technical Order 9-45.

TECHNICS

(Continued from page 14)

One is designed to tie onto the
ife vest, or life preservers of
e type. It is carried in all
e rafts and droppable rescue
e fluorescein dye is contained
ed, waterproof fabric pouch.
d dye marker is designed to be
boats and rafts on vessels. It
ed in a round or rectangular
, sealed with a snap-on bottle
crew-on cap.
these dye markers contain
uorescein dye to produce a
on the surface of the water,
mally persists for a period of
inutes.
dye marker used by the
indicate the initial point of
ith submarines is the Depth Charge Marker, Day, Mark 1, Mod. 1. It was designed to provide a reference point for further search and attack during day operations. The marker consists of a circular wooden block on which is mounted a grenade-firing mechanism. Fluorescein dye is contained in two cylindrical paper cans, one attached to each side of the wooden block. A celluloid tube extending through the wooden block into both the paper cans contains the bursting charge of black powder. When the marker is launched there is a 15-second delay before the bursting charge is ignited. The slick produced persists for approximately 45 minutes.

The visibility of the above dye marker is approximately 3,000 yards from the deck of a vessel and up to 5 miles from aircraft.

HEATED CASUALTY BAG FOR EIGHTH AIR FORCE

An electrically heated casualty bag for protection of wounded crew members at high altitudes has been developed by the Eighth Air Force. The bag maintains normal body temperature and permits injured personnel to be freed of tight clothing and properly bandaged without danger of exposing parts of the body to frostbite. Strap handles on each side facilitate lifting the patient and carrying him from the plane without unnecessary jostling and without use of a litter. The bag is buoyant and can float a 190-pound man in the water if the plane has to be ditched on its return from a mission. (AIR FORCE, January, 1945.)

QUICK DONNING EXPOSURE SUIT

MARK I DEVELOPED BY NAVY FOR AVIATION PERSONN

There has long been a need for an adequate exposure suit to protect fliers who are downed in the colder waters of the world. The Mark I Quick Donning Exposure Suit for aviation personnel has been developed by the Navy to meet such contingencies.

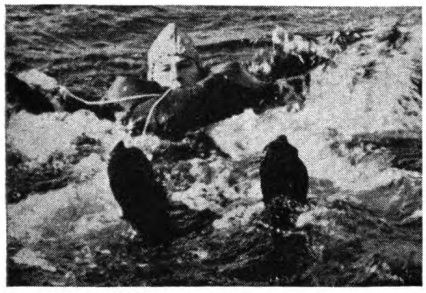


FIG. 2

Description, purpose and operation of the suit (NavAer Spec. No. M–680) is outlined in Technical Note No. 7–45.

The exposure suit (ASO Stock No. R37–S–5332) is a single piece cover-all type suit with attached hood which completely envelopes the body, limbs, and head of the wearer (fig. 1). Quick and positive closure is afforded by a neck drawstring. It is constructed of a lightweight waterproof material and is designed for donning immediately before, or subsequent to, crash landings at sea.

In addition to affording protection from spray, water, etc., the suit when worn over winter flight gear affords a high degree of buoyancy when the wearer is in the water (fig. 2). The suit is supplied in a convenient carrying pouch in one size only and is equipped with two NavAer Spec. M–566 sea dye marker packets attached externally.

The purpose of the suit is to provide protection from immersion in cold waters and exposure to wind, rain or spray when aboard a life raft. If the wearer should become immersed before donning the exposure suit, it will still afford protection if put on immediately after boarding the raft because of the reduction in body heat loss due to the chilling effect of the wind.

The suit is removed from its carrying bag, unrolled and the wearer steps into it through the wide neck. It is pulled up, the arms inserted, the wrist bands adjusted, and the hood placed over the head. The small beads at the end of the drawstring are grasped and the drawstring pulled to within about 6 inches of the neck. The ankle straps should be adjusted so that if a man is small, the legs will not sag down under the wearer's feet. After both leg straps are adjusted,

FIG. 1

the greater portion of the should be vented out thr opening; then the drawstr be pulled up securely ag

It is recommended th sible, entry be made into first. As the suit is wor vest, it will be found eas toggles before jumping i or if in the water, when fl back. In spite of the buo by the suit, the pulling should not be overlooke

The exposure suit is i used in the waters in following areas:

			November thro April
North Atlantic Area:			
East } West }	Above	Lat. 3(Lat. 3	
South Atlantic Area:			
East } West }	Below	Lat. 3 Lat. 3	
North Pacific Area:			
East } West }	Above	Lat. 2 Lat. 3	
South Pacific Area:			
East } West }	Below	Lat. 3(Lat. 3	

Allotment to operatin on the following basis:

1. One unit per crew me pilot and co-pilot) of a airplanes and airships ope areas. This includes Co Marine squadrons and all passengers on NATS flig

2. All carriers operat areas on a basis of 30 ea

(Continued on next

642936—45——3

E ALONE

ed from page 8)

he tends to push you
buoyancy chamber
ou are kneeling and
e to be disrupted. It
at him horizontally
hy, roll him onto the
yancy chamber, and

l the plane, there are
ch should be done at
ential to have them
nd so that they will be
vely. They may seem
effort at the time, and
esults will not seem
the effect of neglecting
t later on.
ions are:
linghy. This is prob-
portant single measure
l effects from exposure.
ather apron.
ngements to collect

n are picked up many
ing in a water-logged
the excuse that they
d couldn't bail at all.
erstand how they felt
ize, but if some urge
carrying out of routine
them bail, their con-
e been much better.

URE SUIT

d from page 17)

h CVE for dropping to

adrons. Six suits per
nes, *regardless of the*
lus the allowance for
nel when operating in
s.
adrons. The number
for the plane's patient
aboard at all times,
ce for the plane com-
erating in the outlined

r-sea rescue squadrons.
e at all times, plus the
for plane personnel
n the subject areas.
tis to be added to the
ice list (for other than
) and is to be retained

)0 of these units have
nd additional procure-
nitiated.

Similarly, the same concept applies to the weather apron. You are very cold. It is adjusted, and probably you do not seem much warmer; it is a nuisance and prevents moving around. It doesn't *seem* to help, but 12–18–24 hours later you will be in a far different condition if you have used it than if you haven't.

Rain may fall in the first hour. You may be in the dinghy a long time; therefore, you cannot afford to waste any rain. Arrange to have the apron ready to collect it so that it runs down into a depression. Have a stowage container ready and the sponge for transferring rain from the apron to the container. Use the first few drops to wash the salt from the apron, and collect the rest.

Next, sit on something if available. If you sit on the dinghy floor, only a layer of macintosh intervenes between your nether regions and the cold sea. This is very depressing. It isn't safe to sit on the buoyancy chambers, so try to utilize an emergency container, a bit of wadded clothing, a parachute, etc. It helps a lot.

Then assess the crew. Determine who will be your right-hand man on whom you can rely for six to ten days, if rescue does not come before then. Mental make-up is much more important than physical in survival at sea. Of two men who are of "equal" character, the one who is physically more fit probably would withstand the strain better. Paradoxically, a quiet determined individual, particularly if he is rather well educated, generally will survive well even if he is of poor physique. A very fit, strong man who is noisily demonstrative and perhaps a bit empty-headed will often succumb rather easily.

ESTABLISH ROUTINE

Establish some routine, assigning everyone some duties to perform. Dinghy and lifeboat crews who keep active and attentive will survive long exposure better than those who remain idle. If there is an injured man, *don't*, out of kindness, excuse him from all duties and allow him to lie idle, if it can be avoided. Try to find some job in the routine which he can perform and persuade him to accomplish it. This is kinder and actually helping him more.

If everything is in good order, arrange some sleep rota. Often there is no room for this, but sometimes there is not a full crew. Sleep in short watches of about two hours, and detail someone to watch over the sleeper so that he can relax without fear of falling over the side. If you are really exhausted don't sleep, but attempt to stay awake. To help this, energy tablets are provided.

Now some attention can be given to the "refinements"(!) of protection against exposure. If you have ditched at night, don't strip off wet clothing to dry until the day is a few hours old. More heat is lost by the exposure than is gained from the small amount of drying. When clothing is removed for drying at high noon, it should be taken off in layers. If you are wearing a relatively wind-proof garment, dry one layer from underneath it first, then replace that and dry another layer from underneath, retaining the windbreaker meanwhile. Finally, when you have two (or more) layers of dry clothing to wear, remove and dry the windbreaker.

Keep moving. If limbs cannot be moved because of lack of space, tense and relax muscles without moving the limbs. Place feet high—on the buoyancy chamber.

Keep flying boots on, unless they are too tight. Boots help to exclude the cold from the feet. When the boots feel tight, however, this is an indication that the feet are swelling. By hampering the circulation, they do more harm than good. Remove them and *do not* replace them. Wrap your feet loosely and keep them as dry as you can. Parachute silk is good for this purpose. If feet are numb and swollen, do *NOT* rub them. Just the right amount of rubbing, at just the right time and in just the right way, may be a good thing —but one cannot hope to do that in a dinghy. Too much rubbing, wrong rubbing, or ill-timed rubbing does a great deal of harm; therefore, *don't rub.*

Again, above all, keep the dinghy as dry as possible.

REMOVAL OF PETROLATUM

The Bureau of Medicine, USN, in a letter to all ships and stations, 18 December 1944, ordered the removal of Liquid Petrolatum, Stock No. 1–575, from the contents of Boat Box, Stock No. 2–185, and from all life rafts, life floats and floater nets. The reason given for the order is that liquid petrolatum (mineral oil) is not effective in the prevention of "immersion foot."

INSTALLATION OF CORNER REFLECTORS IN ARMY AND NAVY RAFTS DESCRIBED

Procedure for a satisfactory method of stowing and rigging the Model MX-138/A corner reflector in multi-place life rafts covered by NAVAER Specification M-3, and the MX-137/A in the one-man parachute type life raft in accordance with ANA Specification AN-R-2, is directed in Navy Technical Order No. 132-44.

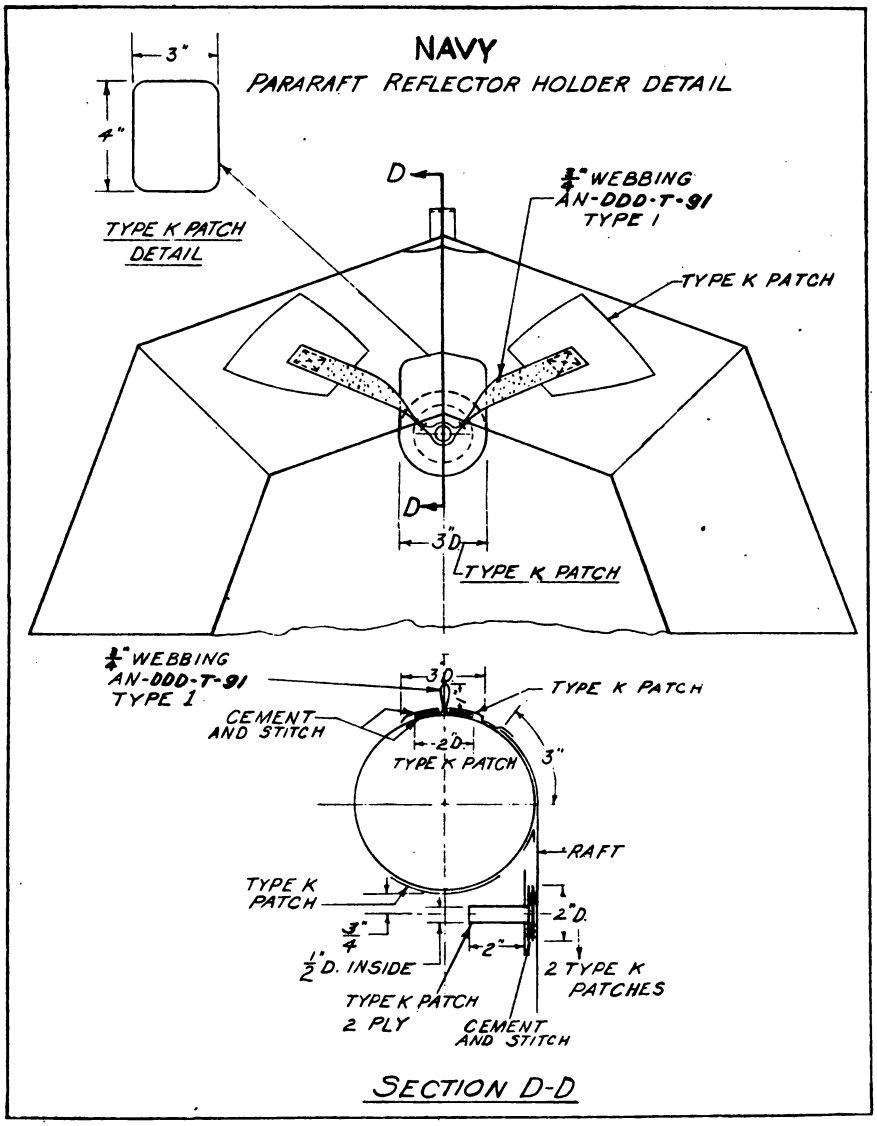
The Army Air Forces provide directions for corner reflector installation with each multiplace life raft unit.

Multi-place Life Rafts, NAVAER Specification M-3

Stowage.—The MX-138/A corner reflector shall be stowed in the life raft oar pocket of the Mark 2, 4 and 7 rafts fabricated under NAVAER Specification M-3r, and all Mark 7 rafts fabricated under NAVAER Specifications M-3q and prior. The oar pockets in the Mark 2 and 4 rafts fabricated under NAVAER Specifications M-3q and prior are not large enough to accommodate the reflector, and accordingly it shall be secured to one of the raft lifeline loops by the nylon line provided on the reflector package. then shall be stowed al pocket when the raft packed into its carrying

Rigging.—The reflec mounted in the stern of it will not interfere wit To provide a suitable hc flector, a mast holder with paragraph D-1g Specification M-3r shall the inside center of all rafts. Two sections of should be used to rig the oar grommets are to be ers on either side of th met to prevent vertical r mast and to maintain rig

(*Continued on nex*



SECTION D-D

ASBESTOS SUIT USE DESCR

The following extrac and use of asbestos su from the January, 1945 *Engineer's Digest*, publ by the Coast Guard.

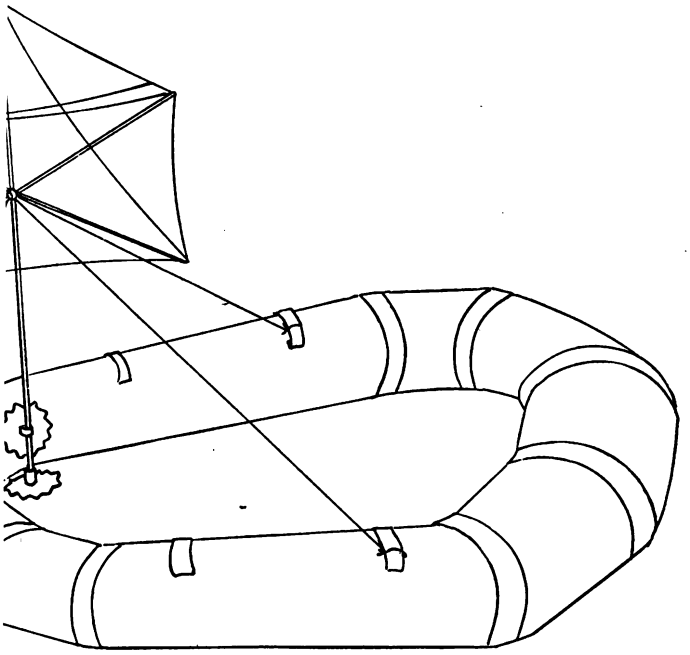
Especially designed use where immediate ac a close approach to fire asbestos suit is used on and on other naval protection afforded by wearer can make close fire and even be expose for a limited period caution must be exer as the suit retains heat, injurious to the wearer.

Extreme care must be the suit as dry as po becomes wet, to keep i steam will be generated due to the intense heat, suit should be donned v cool atmosphere, if po wearer equipped with a of steel where such necessary.

The suit, consisting o foot protectors, helmet fabricated of special li ible asbestos cloth in struction. The protect vided with a heat-resist for clear, unobstructed

(*Continued on ne*

:CTORS (*Continued from page 19*)



'rces have procured a quantity of modification kits, including patches · distribution to field activities. This equipment will be used to modify ·fts for installation of the MX-137/A reflector in the manner shown :tch. This reflector unit also will be furnished with complete instruc-

Multi-Place Life Rafts

Forces multi-place life :tor unit is designated includes a universal the unit to be adapted wooden or aluminum, A-3 or E-2 series life directions for erecting orner reflector are pro-unit.

'ute Life Rafts, ANA AN-R-2

MX-137/A corner re-secured to one of the ift hand straps by the ded on the reflector eflector then shall be r of the parachute raft the raft CO_2 cylinder. ecure the reflector to step, patches and loop e drawing shall be in-:n of all parachute life tor is rigged by means y lines supplied with uy line should be se-)bing loop on the raft her two guy lines at-ft hand straps. Each guy line is provided with a fitting which will permit rapid removal of the reflector if the raft should capsize, and which also will provide for taking up the guy lines to maintain rigidity of the reflector.

ASBESTOS SUIT

(*Continued from page 19*)

Access to the suit is effected through a zipper opening, extending down the front from the neck to the waistline. When closed, the zipper is protected by a flap held in place by buckles. Zipper fasteners are provided at the wrist and lower section of the outside leg seam.

AAF PROCURES SEA WATER DESALTING KIT

A sea water desalting kit recently has been procured by the AAF for use in pneumatic life rafts and over-ocean operations where fresh water storage space is limited.

This kit, designated as Kit, Sea Water Desalting, Type JJ-1 consists of a metal container in which are packed six individually wrapped briquets of salt-removing chemicals, a plastic processing bag and mending tape. The processing bag is a translucent flexible cylinder provided with a filter and outlet tube at one end, and a closure at the other end which is large enough to permit one briquet to be inserted.

The quantity of sea water added to each briquet is governed by a line marking on the bag; each briquet will render about a pint of potable water from the sea water added. The filter at the bottom of the bag holds back all sediment. Mending tape is supplied for repairing the bag. These desalting kits are now available and can be requisitioned using Stock No. 4500-527600.

SUNBURN OINTMENT ADDED TO M-3R PNEUMATIC RAFT

Sunburn ointment has been added to the M-3r pneumatic life rafts by the second amendment to the NavAer specifications. The new item is a 3-ounce container of Eli Lilley and Co. sunburn protective ointment P-40469, or equivalent. This is contractor-furnished equipment and will be stored in the supply pocket of the M-3r life rafts; one container of the ointment supplied with each of the Mark 2 and Mark 4 rafts, two with each Mark 7 raft. Contents will be durably marked on the outside of each container.

Additional Types of Equipment Received for Exhibit

[1 February to 28 February]

Catalogue No.	Object	Source
45.11.1-2	Suit, flying, anti-exposure, quick donning	Wright Field, Dayton, Ohio.
45.13.1-32	Raft, pneumatic, 1-man, PK-1	Equipment and Matériel; BuAer, Washington, D. C.
45.14.1	Block, wood, sister, without becket, swivel eye 6-inch, with tail.	Coast Guard Supply Depot, Brooklyn, N. Y.
45.15.1	Life preserver, 38-ounce, yoke type	BuShips, Washington, D. C.

TWO SURVIVAL ACCOUNTS . . . *Three Days in a Lif*
Adrift For 83 Da

This is Part II of an article written by Lt. Comdr. S. F. Harby, Training Film Branch, Bureau of Aeronautics, USN, for *National Geographic* magazine, and is reprinted here with permission. The first three survival accounts in the series were printed in AIR SEA RESCUE BULLETIN No. 8. Part of the magazine article has been paraphrased.

The survival accounts narrated were chosen as representative of many which have been related by men who have used their resourcefulness and ingenuity while they were castaways, and returned to tell about it.

THREE DAYS IN A LIFE VEST

Ensign J. H. Carroum had just completed a successful attack on a Jap transport in the South Pacific when he was hit by anti-aircraft fire from a destroyer. Limping along, he was easy meat for pursuing Zeros and at about dusk was forced to make a full stall landing on the ocean. His plane, a TBF, landed so hard he was thrown against the instrument panel and knocked out.

When he regained consciousness, he saw his rear seat gunner preparing to inflate the rubber boat, but as Zeros were still overhead, restrained him for fear of inviting further attack. Then, unfortunately, the uninflated rubber boat caught in the tail section of the sinking plane, was carried under and lost.

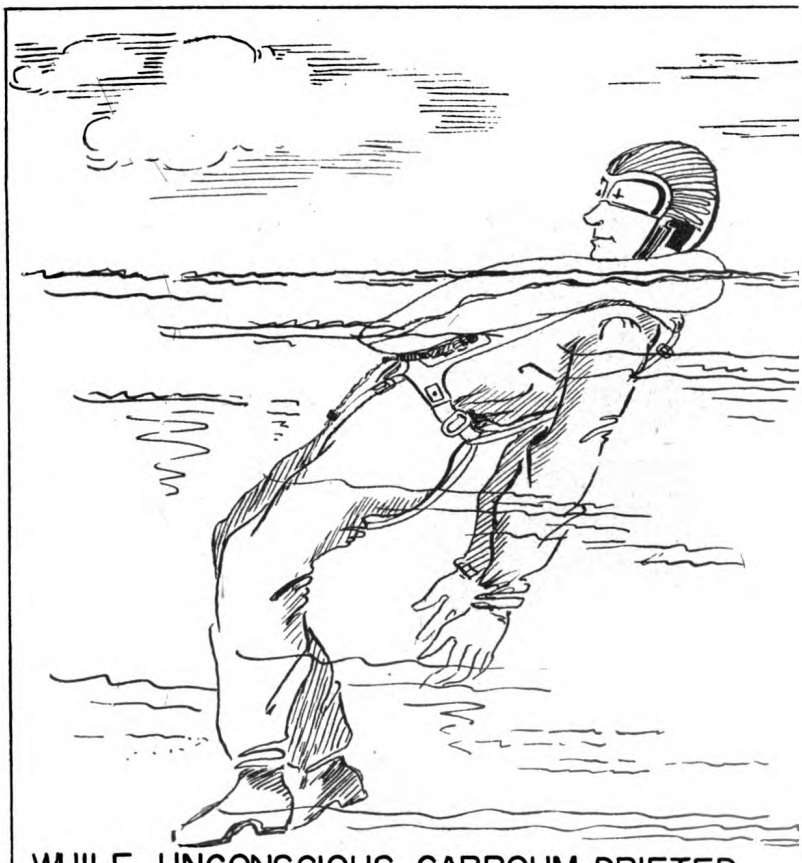
Carroum could see Kobiloko Island to the south, and was not dismayed by the prospect of a 25-mile swim in their Mae Wests, but his companion thought it impossible. They headed south and swam all that night. Carroum, much the stronger swimmer, would have to go back frequently to encourage his gunner and help him along. Just before dawn, the gunner was nowhere to be found. Carroum himself survived by only the narrowest margin and what seems to have been a superhuman effort to make shore.

Daylight revealed that although he was heading south, his course was southwest because of the currents. He adjusted by swimming southeast, but this increased the distance he had to travel. Carroum was only 12 miles offshore on the morning Hynson was lost, and he hoped to make shore by nightfall. He swam all that day, using the breast stroke with the scissors kick, resting approximately 5 minutes out of each hour. He must have swum three times 12 miles but by nightfall was still about 6 miles offshore where the currents were becoming fiercer. His face had swollen from injuries and sunburn until it was hard and tight—one eye had closed and he could barely see out of the other. But he swam on stubbornly and with such exertion that by morning—only 600 yards from shore—he lost consciousness and drifted for what must have been 5 or 6 hours.

When Carroum came to, he saw that he had been swept past Kobiloko Island, and was about 2 miles off Baisen Island, next to it. The offshore currents were still strong and little headway could be made against them. There were other islands in the vicinity; the r Leru, seemed uninhabited, so he for one where he could see smoke By now, his third day, he was s sick and thirsty; but he kept d swimming. About 6 o'clock evening it rained and relieved hi somewhat, but he was ph exhausted and passed out once m

This time he must have drif 10 hours. When he revived rested and able to continue. T was calmer now and he made progress toward shore until a o'clock when his feet struck b The bottom proved to be a co 200 yards offshore where the s the surf broke and tossed him the jagged rock, cutting him in a places. But he knew about co allowed himself to roll with the rather than fight them, and pro

(Continued on page 25)



WHILE UNCONSCIOUS CARROUM DRIFTED ON TWO OCCASIONS

METHOD ADOPTED BY COAST GUARD

EVE METHOD

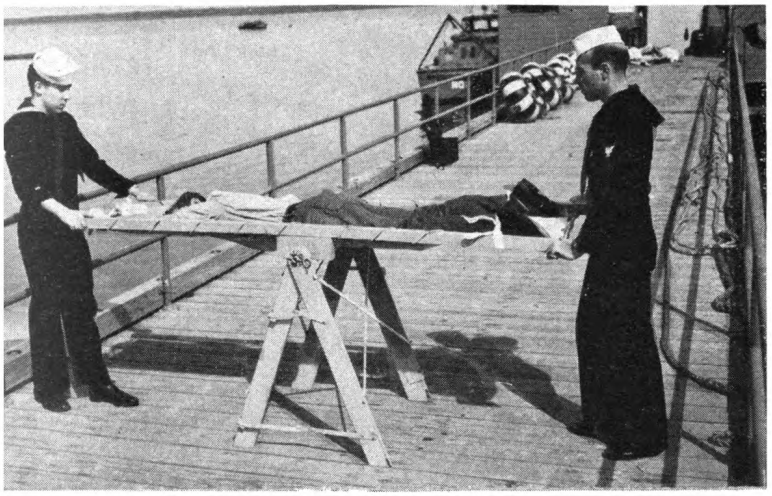


FIG. 4

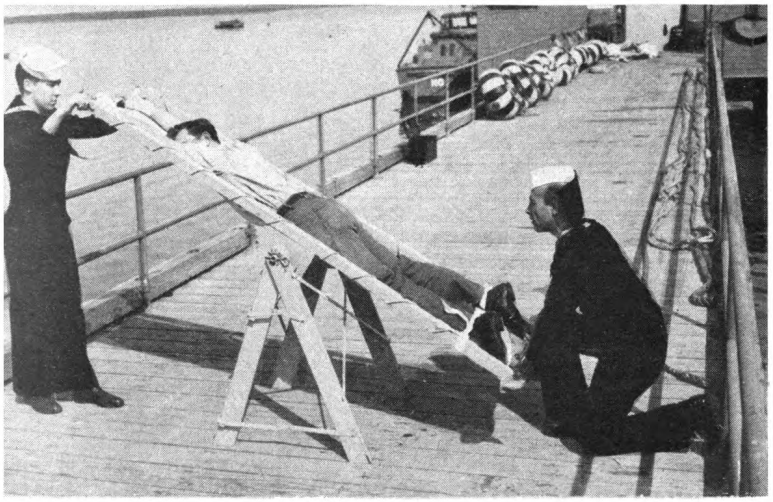


FIG. 5

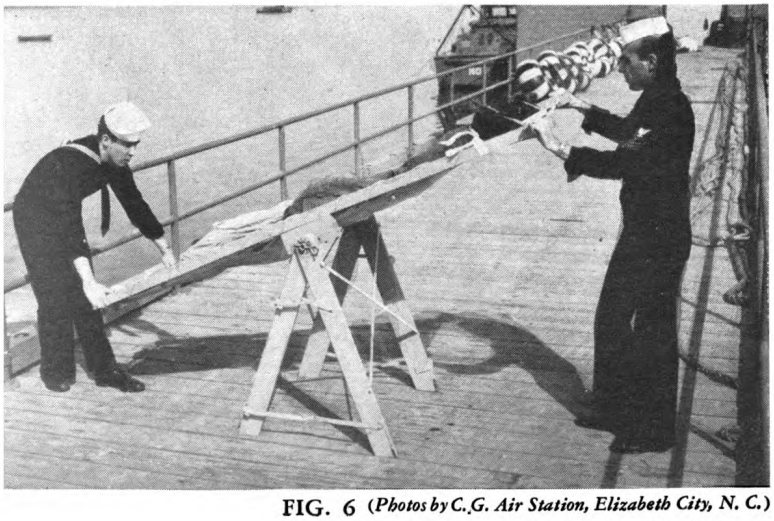


FIG. 6 (*Photos by C. G. Air Station, Elizabeth City, N. C.*)

IN ADDITION

Artificial respiration has been made the subject of a special project of the Coast Guard medical division under Dr. Carl Michel, Assistant Surgeon General, United States Public Health Service. Studies of the Eve method and the Schaefer prone pressure method of artificial respiration and the related subjects of asphyxia and shock were made under the direction of Dr. John C. Grier Jr., Surgeon, USPHS. On the basis of these studies, the Eve method, developed by Dr. F. C. Eve of Hull, England, and adopted by the Royal Navy, has been approved by the U. S. Coast Guard medical officers for use in addition to the Schaefer method.

The Schaefer method of resuscitation for obvious reasons remains the technique of choice under ordinary circumstances. Anyone who has had first-aid instruction knows how to apply it; it requires no apparatus, and it can be put into operation immediately. However, the Eve method is especially suited to cases where artificial respiration must be maintained for some time and the necessary apparatus can be set up while the Schaefer method is being applied.

The report of the project follows:

UNITED STATES COAST GUARD ARTIFICIAL RESPIRATION

Asphyxia

Asphyxia is a condition in which respiration, or breathing, has ceased. It may be the result of either abnormal physiological or physical causes.

The physiological causes of asphyxia may include lack of stimulation of the respiratory center in the brain, paralysis of the respiratory center, and the inability of the blood to absorb oxygen from the lungs or to effect the normal exchange of gases in the body tissues.

When it is due to physical causes, it may be spoken of as suffocation. In asphyxia resulting from physical causes, the lungs are deprived of air because of stoppage of the air passages mechanically. Such causes may include water in the air passages, as in drowning; foreign body in the air passages; diphtheritic membrane extending into the larynx; tumor in the air passages; swelling of the mucous membrane fol-

MEDICOS FOR ARTIFICIAL RESPIRAT
TO SCHAEFER

lowing inhalation of live steam or an irritating gas; constriction around the neck compressing the trachea, and the presence of inert gases in the air. The most frequent causes of stopping of breathing are drowning, electrical shock and gas poisoning. Asphyxia may be present also in victims of shock or collapse, extreme exposure to heat or cold, and chemical poisoning.

Symptoms of Asphyxia

The symptoms by which the necessity for artificial respiration may be recognized are: cyanosis (blueness of the skin and membrane), suspension of respiration, or shallow breathing in some cases of poisoning.

Treatment of Asphyxia

The first thing to do in treatment is to remove the cause of the asphyxia or to remove the victim from the cause. Then administer artificial respiration (see methods below). Later treat for shock (see below). In some cases artificial respiration can be administered while the victim is being removed from the cause to more suitable surroundings. The treatment for shock often can be started while artificial respiration is being administered.

The victim's mouth should be cleared of any obstruction, such as chewing gum, tobacco, false teeth or mucus, so that there is no interference with the entrance into and escape of air from the lungs.

Artificial respiration should be started immediately. Every moment of delay is serious. It should be continued for at least four hours without interruption until the victim is pronounced dead by a medical officer or until normal breathing is established.

Not infrequently the victim, after a temporary recovery of respiration, stops breathing again. The victim must be watched and if natural breathing stops, artificial respiration should be resumed at once. Perform artificial respiration gently and slowly. Roughness may injure the victim.

Every precaution must be taken to prevent further injury to the victim. It may be necessary to give artificial respiration over a prolonged period of

(Continued on next page)

SCHAEFER METHOD

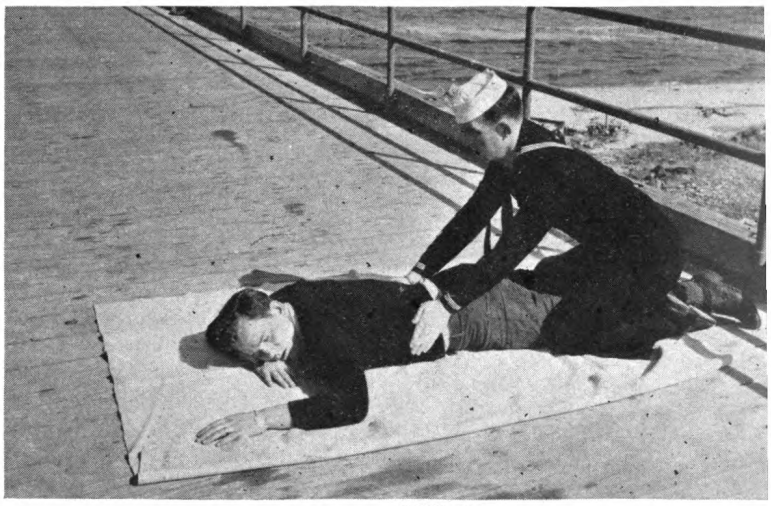


FIG. 1

FIG. 2

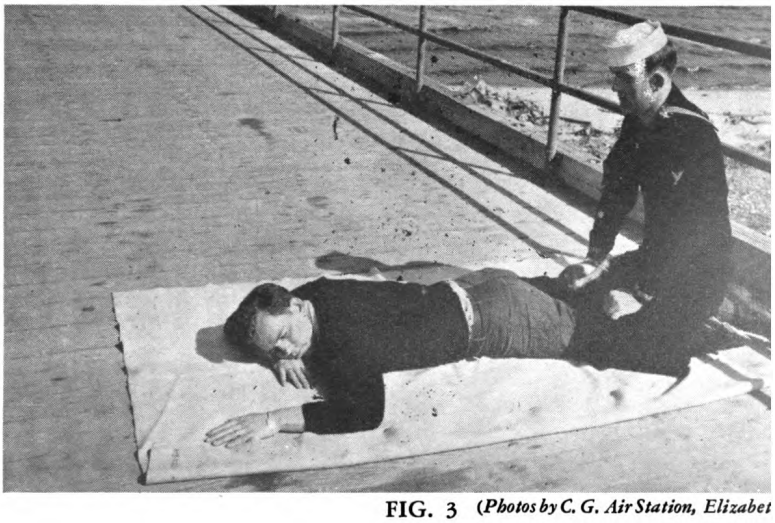


FIG. 3 *(Photos by C. G. Air Station, Elizabet*

ıe methods that require the of pressure, injury to the nd internal organs must be

ne Pressure Method

efer prone pressure method d on for a considerable length one person without danger m if the operator does not ; pressure. Its principle is compressing the chest and e pressure, thus causing air of and into the lungs. Ap- 60 pounds pressure is prob- ənt even for a large adult. gh a different method of piration is to be used later, method should be used until ıre such as to permit institu- Eve method.

ıe victim on his abdomen, ended directly overhead, the ɔent at the elbow and with ırned sideways and resting or forearm, so that the nose are free for breathing. (See ɔosition.)

straddling the victim's side toward which the face is h your knees placed at such from the hip bones as to position shown in the figure. palms of the hands on the ; back with the fingers rest- ribs, the little finger just e lowest rib, with the thumb in a natural position and the fingers just out of sight.

ıhe arms held straight, swing wly, so that the weight of ı gradually brought to bear ictim. The shoulder should over the heel of the hand at the forward swing. (See ıd position.) Do not bend This operation should take ıeconds.

mmediately swing backward ıove the pressure completely. third position.)

two seconds swing forward ɔeat unhurriedly 12 to 15 ıute the double movement of ı and release, a complete in four or five seconds.

on as artificial respiration tarted and while it is being an assistant should loosen clothing about the victim's t or waist. The victim ept warm.

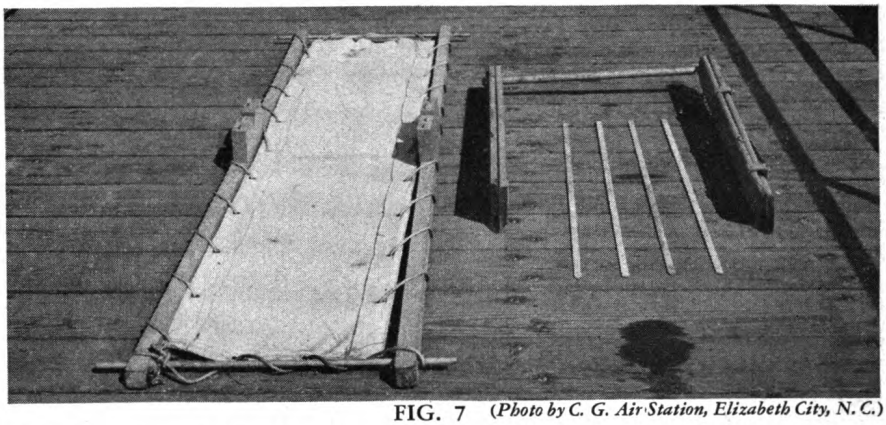


FIG. 7 *(Photo by C. G. Air Station, Elizabeth City, N. C.)*

7. When natural breathing has been restored, the victim should be treated for shock.

8. In carrying out resuscitation it may be necessary to change the operator. This change must be made without losing the rhythm of respiration.

Eve Method

The Eve Method of Artificial Respiration makes use of the weight of the abdominal organs alternately to push and pull the diaphragm up and down in the manner of a piston and consists of rocking the victim securely lashed to a litter or board over a fulcrum. It is easy on the victim, less tiring to the operator, and requires less skill. Its disadvantage is the fact that it requires some apparatus, namely a litter, or board, and fulcrum. (See fig. 7 and 8.)

1. The victim is laid face downward on a litter or board, with arm outstretched.

2. The ankles and wrists are secured to the litter or board.

3. The litter or board is placed on a fulcrum. (See fig. 4.)

4. The litter or board is rocked at 10 double rocks a minute with a tilt each way of 45° to 50°. (See fig. 5.)

5. In resuscitating an apparently drowned person the first head-down tilt should be maintained until no more water drains from the stomach or lungs.

6. Continue until normal breathing is restored or until the victim is pronounced dead by a medical officer.

7. The victim should be kept warm.

8. When artificial respiration has been started, the treatment for shock should be instituted.

Shock

Shock is the term used to describe a condition in which the activities of the body are greatly depressed. The usual characteristics are pale face, weak and rapid pulse, great lowering of the blood pressure, listlessness, dulling of sensibility, subnormal temperature and irregular gasping breathing. There may be cold sweat present. Some degree of shock follows most injuries. It may be slight and last only a few seconds, or it may be serious and even fatal. It may come on immediately, or be delayed, coming on several hours later. It may be due to profuse bleeding, exposure to cold or poisons taken internally. It is almost always found in individuals who have had an interruption of breathing, whatever the cause.

If the victim is not in a condition of shock, he should receive treatment to prevent the development of shock. The same measures are used to prevent shock as to treat it.

Treatment of Shock

When the victim revives, he should be kept under close observation for 48 hours even though he apparently feels all right. He should not be permitted to exert himself in any way.

The fundamental factors in the prevention and treatment of shock are heat, position and stimulants.

A. Heat—this is the most important factor.

1. Preserve body heat.
   a. Protect from exposure to cold.
   b. Remove wet clothing and dry the victim.
   c. Wrap the victim in blankets.
2. Apply external heat.
   a. Care should be used to avoid burning the victim.
      (1) Test the object used for applying heat by holding against the cheek or elbow for half a minute.

(2) Wrap in a layer of cloth or paper.

b. Methods of applying external heat.

(1) Hot water bottles.

(2) Chemical heating pads.

(3) Glass jars and bottles containing hot water.

(4) Hot bricks.

(5) Electrical heating pads.

c. Apply heat to various regions.

(1) To the feet.

(2) Between the thighs.

(3) Along the sides of the body.

(4) Over the abdomen if not uncomfortable to the victim.

B. Position.

1. Place the body in such a position that gravity will help the blood flow to the brain and heart.

a. Lay the victim on his back with the head low.

(1) This can be accomplished by raising the foot of the bed, cot, bench or litter so that he is lying at least 18 inches higher than the head.

(2) If on a flat surface and other means aren't available, elevate the feet, legs and thighs.

C. Stimulants.

Give in small quantities at a time. Do not attempt to make an unconscious person drink.

1. Aromatic spirits of ammonia—a teaspoonful in half a glass of water is one of the most satisfactory stimulants. This can be repeated every 30 minutes as needed.

2. Coffee and tea both contain the drug caffeine, which is an excellent stimulant. Give the coffee or tea as hot as can be taken comfortably. A cupful may be given every 30 minutes as needed.

3. Hot milk, or even hot water, has some stimulating effect, due to the heat.

4. An inhalation stimulant, such as an ammonia ampule or aromatic spirit of ammonia on a handkerchief, may be placed near the victim's nose in cases in which the victim is not conscious. The one administering the stimulant should always test it on himself first.

5. Whiskey should be given only in very unusual cases.

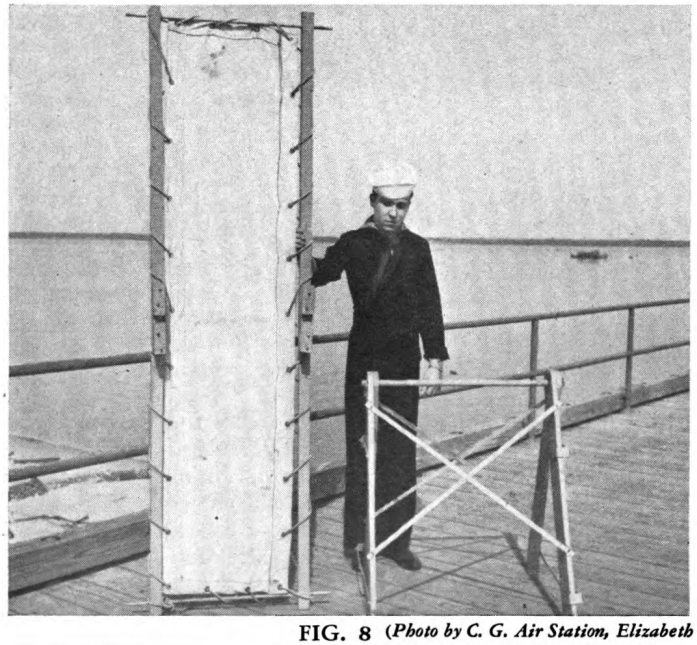


FIG. 8 (*Photo by C. G. Air Station, Elizabeth City, N. C.*

TWO SURVIVAL ACCOUNTS

(*Continued from page 21*)

to paddle and crawl over the rocks instead of hanging on or trying to walk. In this way he reached the protected lagoon and made his way to the shore.

There was a pool of rain water on the beach. Carroum crawled to it and drank his fill. He also found a coconut on the ground, cracked and ate it; then fell asleep.

Atabrine and Quin Malaria Treatment ject of Report

Results of a study of the co activity of quinine and atabr treatment of European pa fected with West African *falciparum* malaria are repor 2 February 1945 *BuMed N* The patients were divided int of 40 each. In 1 group eac received 2 grams of quinine c days; in the other group the to for each patient was 2½ grai brine in 6 days, 9/10 gram ha administered the first day.

While there was wide variat initial parasite counts of both the cases treated with ata average count was higher. D difference in severity, there significant difference in the re treatment.

The doctors concluded: "It commonly held belief that the drug of choice in the tre malaria, atabrine being but a substitute. The results repo show that such a view is ill-fou has already been demonstr atabrine used with heavy init can deal effectively with hea tions by *plasmodium falcipar* above results indicate that it at least as effectively as quinin over, there is no evidence that bination of atabrine and q superior to either of these d alone." (*Findlay, Markson an 1944.*)

Friendly Natives

He was awakened next m friendly natives who cared He stayed with these people was well enough to travel, ceeded to a larger village whe another American flier, a Hurst, who already had sent w safety back to base and was rescue. Meanwhile, the Japs of their presence and annou they were coming to get the fliers. Carroum, Hurst and t prepared an ambush for the were fully prepared to kill

(*Continued on next page*)

ıt the Japs merely came
.ore, talked to natives in
vent away without landing.
ay a Catalina arrived and
ugees back to the American
:oum joined his squadron
Enterprise after an absence
:eks.

)R 83 DAYS

3. *Zaandam* was a Dutch
r, leased by the United
the Netherlands fell to the
: was carrying a mixed crew
nd American seamen when
)00 miles off Recife, Brazil.
Basil Izzi and Ensign John
the U. S. Navy gun crew,
reckage and floating debris
ts and a day, following
They were finally taken
:ge raft already occupied by
t, Hoogendam, and Beezley.
men thus thrown together
lly assorted group. Beezley
gh-and-tumble sailor from
Mo. He was the oldest, 38,
: first to reach the raft.
Slot, 37, was an experienced
ı oiler from the crew of
ship. Maddox, 29, was a
icer. Hoogendam was only
d been a fisherman in the
s until the Nazi invasion,
pped, for the first time, as a
seaman. Izzi, 19, was an
:rican from South Barre,
had been in the Navy only
e prior to the shipwreck and
a l training for an emergency.
Dutchmen spoke a little
t were by no means fluent.
as a former instructor of
Purdue University. Izzi
nnery officer were the only
new each other at all well.
ntory of equipment and
owed that they had three
a canvas tarpaulin, several
:es of canvas, a life ring, a
sticks, two paddles, some
ı of matches, a first-aid kit,
sors, some flares, two pocket
: cans of milk, a few dozen
scuits, 10 gallons of water,
ınds of chocolate.

Days

l and drink, properly ra-
ld last them about 18 days.
ful consideration, it was
t in the morning each man
should have a cup of water with a piece of cracker; in the afternoon, a half cup with a little milk and cracker, and at night, a cup of water, a piece of hard-tack and a fifth of a cake of chocolate.

All the men were wearing trousers, shorts, and shirts except Izzi and Maddox, who dropped theirs while swimming in the ocean the day of the sinking. Izzi had nothing but a shirt, and Hoogendam was the only one of the group who saved his shoes. None of the five had a hat, so all suffered terribly from sunburn and exposure.

Izzi was forced to make pants of his life jacket; and Maddox, who had a bad pneumonia record, to cover his shoulders with one of the small pieces of canvas. All developed salt-water sores early on the trip, and Hoogendam, in addition, had a bad gash on his knee from the torpedoing, which had blown him overboard.

The men apparently didn't realize the seriousness of their situation because they made no attempt to rig an awning and very little effort to catch fish or birds. They even fed some of their crackers to the birds and threw away other useful articles, such as the pair of shoes.

Maddox showed ingenuity when he made fish spears of a pair of scissors, and also when he caught a shark with a rope noose. He had noted that the sharks would come straight for the raft, then dive a little and swim under it; so he spread his lasso along the edge of the raft and hung it in the water. When a shark came through, the noose was jerked and the shark snared by the fins. The men ate the heart, liver and a little of the white meat, putting the rest away in a locker, where it spoiled and had to be thrown away.

As they grew hungrier, they also snatched birds. Hoogendam was the most agile, and he proved good at catching not only birds, but also small fish which he would get through the slots in the bottom of the raft.

An Albatross For Thanksgiving

Once an albatross circled their raft, and Hoogendam became excited over the prospect of catching the bird. After watching it circle and light on the water 3 feet away, Hoogendam could be restrained no longer. He made a dive for it.

The other men grabbed his feet as he jumped, for there were many sharks in the vicinity, and quickly hauled him back on board with the panicky albatross pecking away at his hands and face. It was a triumph for Hoogendam. The bird, which was as large as a chicken, served as the main course of their Thanksgiving dinner.

After the original supply of drinking water was exhausted, the men caught rain water in their tarpaulin and stored it in cans. Nevertheless, they suffered much from thirst and hunger.

They were in a warm latitude and drifted northeastward across the Equator toward the West Indies. During the first 5 weeks they suffered most from heat and thirst. Later they had a great deal of rain and were chilly much of the time.

Near Rescues

On the eighteenth day out, Ensign Maddox spotted the first ship. Excitedly they set off flares, waved their flag and shouted; but no response came from the ship. They had one consolation, however—the thought that they must be in a shipping lane, and the prospect of other opportunities boosted their spirits. The next day they sighted a second vessel, but had no better luck attracting attention.

They sighted a third ship on December 15 and were passed up once more. Their forty-third day on the raft, they were low and discouraged by this time.

Quoting Izzi, "We all slumped down and cried. We had convinced ourselves that a third ship would not pass us up, and this one had gone right on by, away out there in the distance. We didn't talk much about it; we just sobbed."

The descriptions of Beezley's death on the fiftieth day, and that of Maddox on the seventy-seventh, are typical pictures of dehydration and starvation. The three who came through were flexible and quickly adjusted to the raft life, determined not to submit to their environment.

It was more than a month before their hopes were raised again. On the eighty-second night, as their raft approached Trinidad, they heard motors and spotted an airplane high above them. It was too far away and the light of day almost gone, but it made them feel good to know that they were near some place where airplanes operated. The next day they saw another, and then several in succession.

Each time their hopes rose a little higher, and finally on the eighty-third day they sighted the convoy which picked them up. They had no way of signaling by then, except to stand and wave the flag. Even this was impossible for any one of the three to do alone; but the other two assisted Van Der Slot to stand and wave, which attracted the attention of a U. S. patrol craft, and it came speeding to their rescue.

Aboard the PC boat that picked them up the three survivors were attended by a hospital corpsman, who nursed them with excellent care. They were put ashore at a naval hospital in Brazil and after several months of rest fully recuperated.

Without Water for Four Days

Maddox died only 6 days before rescue came. Immediately prior to his death the group was without water for 4 days. He was delirious and thought the others had water which they were keeping from him.

Soon after this, Van der Slot discovered that one of the food containers, long unused, had a little dirty water in the bottom from condensation during the cool nights. They eagerly strained this water through a handkerchief and were able to salvage two cupfuls which lasted them for 3 more days. Then it rained again.

Even toward the end of their voyage the men found it refreshing to wet their bodies in the cool sea. They would tie a rope about their waists and one at a time go overboard, supported by the others.

One day while swimming in this manner Van der Slot discovered that there were shellfish attached to the bottom of the raft. These were carefully gathered and eaten, including the shells. Thereafter the men would take turns going under the raft in search of snails and barnacles.

Summary

Five men living in such close quarters under such trying circumstances were bound to irritate each other's nerves, especially five men of such widely different temperaments and backgrounds. As their physical condition depreciated, nerves were worn thinner and thinner.

Strong leadership is usually the means of avoiding or suppressing bad feeling, but with this particular group no one man emerged as the natural leader.

THE BURMA HANDBOOKS

FOR AMERICANS . . . FOR JAPANESE

Doctrines, theories and methods prepared by the enemy are both us interesting. The Japanese conceptions in particular have been different. following comparison between an American document and one preparec Japanese on the same subject, marked contrasts in ideology and appr noted.

The American booklet is the Armed Forces' *Pocket Guide to Burma*, p by the U. S. Army Service Forces, Special Service Division. The other *Handbook*, was propagated by the enemy in July, 1943, for the use of soldiers and was translated by Lt. William Magistretti, AUS, for OS CBI, New Delhi.

As the comparison is made from the standpoint of rescue and survival, the political discussions (on which the Japanese booklet enlarges) and other of primary interest only to occupational troops is omitted.

A survivor of a plane crash who becomes a "walkout" in Burma can considerably if he has knowledge of the characteristics of the people, religio methods of transacting business, and basic health precautions. It also s to his advantage if he knows the enemy's ideas on the same subject.

INTRODUCTION

THESE PARAGRAPHS ARE THE OPENING WORDS OF THE T MANUALS

ARMY:

I claim we got a hell of a beating. We got run out of Burma and it is humiliating. I think we ought to find what caused it, go back and retake it.

JAPANESE:

Our great Empire arose decisively with th tive of building the Greater East Asia C sphere. Burma has become independent an

'eater East Asia Co-prosperity sphere.

Burma must be truly one body for the f the war. Operations of the Imperial ma decorate one page of the war of Greater The recent activities on the India-Burma isplayed fully the flower of the Imperial ave finally gained the absolute confidence ie.

nts on related subjects are e after the other, the Japanese italics. Subheads have been aid in organizing the informa- ierwise no editorial comment on has been made.

nslator of the Japanese hand- :ted the mileage map listed in of contents; therefore, no com- n be made of it with the sev- in the Army guide. Nor is it ıether the Japanese book had ns comparable to ours. Ex- the mention of maps in the contents, the Japanese guide ıo geographical discussion.

le Includes Other Pertinent In- tion

S. guide contains a great deal :al information omitted from ese handbook, including a table nd their value, a table of com- weights and measures, and a ın of time and date with the e and zone.

t 30 pages of the Army guide discussion of the Burmese and a list of the most useful d phrases, with a phonetic pronunciation. Apparently needed by the Japanese, who mention of language difficul-

ıth Guides

nt of the Japanese book is con- e to a victor who intends to ople of Burma to his own ends. nt of the Army booklet closely that of a guidebook which practical information for living ıge country with cultural in- which will add to the GI's t of his tour of duty. Kipling ; several references are made ct that the soldier stationed is a lucky guy.

ACTERISTICS OF THE PEOPLE

E

ese respect Japan and the Japanese so ch and lead them in a spirit of kindness ıe right along with us. However, it is

(Continued on next page)

List of Motion Picture Films Relative to Air-Sea Rescue Available for Screening at Air Sea Rescue Agency

An annotated list of motion-picture films on subjects relative to air-sea rescue which are on file with the Air Sea Rescue Agency library is compiled and published here for information and reference In most cases the Agency does not have duplicate copies of the films and for this reason it cannot make a practice of lending them. They may be seen at the Agency,. None of the films in the following list is classified higher than restricted.

FILM TITLES AND SUBJECTS

No.[1]	Title	Subject	Released	Running time (minutes)
MN-1145 TF 21-1244	Abandon Ship	Discusses prescribed methods of leaving ship, escaping through oil, types of emergency flotation equipment, including rubber rafts, life jackets, and improvised flotation gear.	1943	32
MA-934 TF 1-327	Aerial Navigation	Shows various radio aids available to pilot and navigator, including radio range station, radio compass, and use of general radio equipment. Methods of quadrant identification are described.	1942	30
MN-2306a	Castaway	Contains information for living at sea in a one-man rubber raft, survival of a Navy fighter pilot on a dry atoll, and living off a tropical Pacific island.	1944	64
MA-507c TF 1-544	Celestial Navigation—Bearings, Single Lines of Position.	Defines bearing, line of position, circle of equal altitude, fix and intercept, plotting of assumed position and intercept, and selection of celestial bodies for observation.	1942	18
MA-507g TF 1-548	Celestial Navigation—Land-Fall Flight.	Describes the use of Line of Position in aerial navigation and its use in establishing landfall by various methods: single landfall, stationary curve, double curve.	1942	14
MA-507d TF 1-545	Celestial Navigation—Latitude by Polaris.	Shows relationship between latitude and elevated pole, position and diurnal path of Polaris and reduction of altitude of elevated pole. Methods of solution by mathematical formula and use of tables are described.	1942	10
MA-507f TF 1-547	Celestial Navigation—Star Identification.	Offers simple and explicit directions for identifying the constellations and individual stars which have greatest importance for celestial navigational purposes.	1942	12
MA-507e TF 1-546	Celestial Navigation—Time.	Explains various time elements in celestial navigation which are used in solving practical exercises.	1942	10
MH-2269F MTF-17	Combat Swimming	Demonstrates swimming instructions for nonswimmers; shows more advanced training for swimming with full pack, escaping through burning oil, correct procedure for jumping overboard, and lifesaving techniques.	(2)	20

TRAINING AIDS AND PUBLICATIONS

No.[1]	Title	Subject	Released	Running time (minutes)
TF 1-333	Crash Landing in Unfavorable Terrain.	Basic procedures for safe crash landings of fighters and bombers in unfavorable terrain are demonstrated by means of model planes and sand tables.	4-12-44	20
MB-3750 AF-112	Ditching Before and After	How to put the C-46 airplane down on water; duties of crewmen during such an emergency; launching and entering Type A-3 five-man life raft.	1-31-44	35
MB-2831 TF 1-3634 14C-779	Ditching Without Hedging.	With models and a unique catapult device, the film demonstrates the correct and incorrect methods of landing British landplanes at sea.	12-29-43	22
MA-3432 TF 1-3335	Emergency Care of Aircrew Casualties.	Proper emergency methods of treating aircrew casualties for abrasions, wounds, arterial bleeding, fractures, burns and shock are demonstrated in Flight Surgeon's office on simulated wounds.	11-3-43	58
MG-1961 MCG-123-5	Emergency Lifesaving Fishing Kit.	Detailed instructions for use of Pinchot-Lerner fishing kit; demonstrates use of each item and gives many helpful fishing instructions.	1943	19
MN-2829a	Emergency Rescue Equipment, Life Jackets and Suits.	Demonstrates methods of donning kapok jackets, inflating pneumatic belts and vests; procedure for jumping overboard with this gear; and care and treatment of life jackets and inflatable belts.	1944	20

(Continued on page 30)

ARMY

As a whole the Burmese are characteriz
liness, a sense of humor, and a love of sp
dicted to a life of ease and laziness. (En

JAPANESE

*The Burmese has the characteristic of i
being easily bound up in things and of d
great amount of labor.*

ARMY

In sum, and not exclusive of the last p
for ease), those are the qualities which s
appeal to an American, and which conve
that your tour of duty in Burma will be s
friendly relations with an interesting an
progressive people.

The women of Burma still smoke "wha
cheroots," . . . you may at first be ast
the number of Burmese with unsightly
discolored teeth and gums. Despite thi
lasting impression will be one of a peopl
reached a relatively high order of living .

JAPANESE

*They like to smoke a great big cheroot, a
engage in business, sing and dance, bathe s
a day, and spend their days loafing aroun
This is the former pattern of daily life of
Burmese.*

BURMESE ATTITUDE TO WOMEN

ARMY

The . . . encyclopedia . . . appropria
describing the general characteristics of th
"The women are more industrious and b
than the men, but their school educatio
neglected." Burmese women enjoy an
freedom unusual in non-European races.

(Continued on next page)

BURMA HANDBOOKS *(Continued)*

necessary that we remember quite well that they have the character of being stuck up . . .

The activities of the Imperial Army in Burma are the object of world attention. Military discipline and conduct must be severe. The officers and soldiers stationed in Burma should have thorough knowledge of the country. They should lead and win over the Burmese so as to manifest the solidarity of Japan and Burma and at the same time they should be prudent and circumspect in their activities. They should be brave in battle so as to carry on the outstanding work of those who have gone before them and thereby carry out his Majesty's intent . . .

It is not logical that we should expect the same of the Burmese as we do of Japanese, for they are behind us in culture, temperament, and customs.

Laborers, who are weak in the spirit of working, exhibit a capacity for work only two-thirds that of the Japanese . . . It should be absolutely prohibited that one hit workers in order to speed them up. There are instances in which coolies and laborers have left because attention was not paid to this detail.

Prior to the war employees had only one type of work per man. If one were to ask a cook to draw water he would immediately leave.

We should gradually change this system along the lines of the system current in Japan, but attention should be paid to the contract at the time of hiring and to the use of the man immediately after he is taken on.

That Whacking White Cheroot

O-Hsee Dance

E

se prize their women and accordingly the women is high. We would not be far ing that Burma is a country where the ed and the man occupies a lower position. s among government officials . . . woman If you make any passes at the Burmese re in for a time of it. Many instances ade a pass at a woman . . . killed by her

se woman does not marry early, but a girl usually has one or more YIZA . . . ated as a suitor but is not entirely in the aning of the term. Some of them are me are merely friends. Complete secrecy in these matters. . . .

BUSINESS

ops and markets, they do not haggle or ich as the average Oriental. They will and name their price usually, and the en yours—take it or leave it. They prices, but their merchandise is of good n they have it. The country is now cluttered with Japanese-made goods all merchants regard soldiers as good a gold brick or a fur-lined mess kit.

E

se) is weak in figures and inferior in busi- ior to the war . . . business was con- rp Indians. He has no attachment for ittle inclination to make bank deposits. kes a little money he gathers together his cquaintances and eats it up or else he s a gift to a temple or buys a precious stone. n his wages in a large amount and at one ake a vacation . . . until he has no more e raise wages . . . to get more help, it will se effect of the laborer's vacationing for the e increase.

MANNERS

rade or when visited in their homes the al simply and with a lack of formality Americans welcome. Shaking hands eral practice, though some Burmans tern education . . . exchange hand-

E

se are usually unamiable and do not greet is common for them not to say "Thank h they have received some favor at your may think . . . it would not be a n of their thankfulness . . . ho do not understand that attitude receive sion of the Burmese.

RELIGION

ese are Buddhists and their religion emost part of their life, and is one of the for the picturesqueness of the country, and hamlet being marked by its own generally by a monastery. The spirit- very village is the yellow-robed ongyi or

u attend Burmese festivals and pwes ntertainments) keep everything under eave the show to the participants . . . hist New Year comes in April and is y Burmans throwing water over one

(*Continued on next page*)

LIST OF MOTION PICTURE FILMS (*Continued*)

No.[1]	Title	Subject	Released	Running time (minutes)
MN-2829b	Emergency Rescue Equipment, Floats and Floater Nets.	Designed primarily to instruct personnel on vessels operating in combat zones the use of floats and nets stowed aboard ship in the event of abandonment in a disaster.	1944	11
MN-299a	Essentials of First Aid	Describes some medical facilities afloat, methods of transporting and protecting injured men, rescuing and reviving men overcome by smoke, contents of Navy first aid kits, and treatment of wounds.	1942	30
MN-1329	Forced Down at Sea	Demonstrates various types of rubber life rafts and lists emergency equipment stowed in them. Explains how to inflate and enter raft.	1943	24
MA-2172 TF 1-492	Formation Flying	Illustrates basic principles of elementary formation flying, positions of leader and wingmen, basic signals and precautions for beginners.	1942	8
MG-2160a	Handling a Lifeboat Under Oars—Rowing—Part I.	Demonstrates proper wrist and body movements in rowing, and points out the four phases of a complete stroke.	1943	11½
MG-2160b	Handling a Lifeboat Under Oars—Commands—Part II.	Gives and demonstrates various commands pertinent to handling a lifeboat under oars and shows proper stance to be assumed by Coxswain and men.	1943	10
MB-3200 14C-643	It's Your Pigeon	Use of carrier pigeons by RCAF for homing SOS messages of crashed aircrews; instructions on training, care, and method of launching pigeons in disasters.	(2)	21
MA-2627 TF 1-3403	Land and Live in the Arctic.	Emphasizes measures aircrewmen must take for bodily protection against snow and subzero temperature after forced landings in the Arctic. Shows how to improvise shelter, obtain food.	8-30-43	58

TRAINING AIDS AND PUBLICATIONS

No.[1]	Title	Subject	Released	Running time (minutes)
MN–3854 TF 1–3346	Land and Live in the Desert.	Explains and illustrates protective measures to follow when aircrewmen are forced down in desert terrain. Discusses improvised signals and shelters, protection against heat and sun.	4–12–44	40
MA–4206 TF 1–3347	Land and Live in the Jungle.	Explains right and wrong protective measures for aircrewmen to follow after forced landings in the jungle. Illustrates shelter, water, and travel through jungle terrain.	1–28–44	62
MG–1760 MCG 105–J	Launching a Life Raft	The construction of a wooden life raft is discussed and its launching and handling in water are demonstrated. The supplies and equipment aboard the raft are pointed out and discussed.	1942	13
TF 1–3300	Learn and Live	A safety film for pilots. Dramatizes, in fantasy form, some common errors in flying safety and emphasizes the necessity for the pilot giving constant attention to the job of flying his airplane.	3–8–43	45
MN–2612	Making Seawater Drinkable.	Explains action of seawater upon the body. Describes newly developed desalting kit, reaction of chemical briquets on seawater and how pure water is obtained.	1944	13
TF 1–3343	Malaria Discipline	Designed to impress on all personnel necessity for taking proper measures against malaria. Discusses worldwide prevalence of malaria and how the Anopheles mosquito attacks its victims.	4–12–44	35
TF 1–808	Miscellaneous Cold Weather Operations of Aircraft.	Treats hazards of subzero weather operation of aircraft in a typical arctic situation; includes immobilization and malfunctions of equipment, winterization procedures for aircraft and equipment.	8–31–43	17
MA–2188 TF 1–487	Oxygen Equipment—Types and Use at High Altitudes.	Identification and explanation of oxygen masks and regulators; checking direct-flow indicators with ground flow check meter; types of oxygen installations on airplanes.	1942	24
MA–4583 TF 1–2665	Parachuting into Water	Describes actions during descent, method of getting clear of parachute harness, inflation of Mae West, breaking out rubber raft, use of sea marker, "riding" chute.	4–6–44	31
MN–1334a	Patrol Bomber Equipment—Part I.	Stresses the importance of stowing all necessary gear for flight and shows the use made of the equipment.	1943	12
MN–1334b	Patrol Bomber Equipment—Part II.	Explains how to compensate for elements when bombing in a tail wind, a head wind, and when a moving target is moving toward, away, and at a drift angle to the plane.	1943	11

(*Continued on page 32*)

BURMA HANDBOO

(*Continued from page 30*)

another as we do confetti. The Burm have a religious significance; the so regard them with restraint.

The chief precept of the Buddhist i good works on earth that he will be pre next reincarnation. The bestowal of a ing of rice to priests, the founding of a the building of a rest house for traveler of high merit.

These are things which an America stand and respect, even though he prac religion . . . Be ever mindful that a co dignified attitude toward all things pert religious life of the country is paramou

(No Japanese comment on this subj because of a similarity between Japan mese holidays.)

TEMPLES

JAPANESE

The Imperial troops' observance regar has been quite well carried out but the instances at the time of the occupation in u temple in a compound has been used storage purposes, or in extreme instanc laundry, for drying pants in the entrance or in cases in which the interior of the ten as a latrine. Attention should be paid to which aroused the antagonism of the Bu of some carelessness . . .

There have been some instances where B have been pressed into work as coolies. unfortunate.

(*Continued on next page*)

:RN BRITISH RULE

tish rule one authority remarks, "Per- the history of any country has the en its past and its present been so ɔid." The conditioning influences of ıdministration, expanded commerce ıizing effect of education and medical ·ibuted to Burma's forward surge. ırmese profited by these general ad- · sense of unity and of nationhood ɔr, and by degrees they progressed in t within the framework of the British ; ago, Burmese women with property ·ere given the vote. Finally partial granted Burma in 1937, the last major he national history to precede the apanese plague.

ɜh administration the Burmese had he wise use of freedom in much the he Philippines. But when the dike aya and the Japanese crossed the- n the passage of one month the Bur. uced to a state worse than slavery . .

ɜ

war of Greater East Asia and prior to ıct, the British government considered a nce into Burma as a dream. Army ithdrew into the summer resort . . . only guard Burma whose area is the same as ıtry.

ɔk a policy of despising and paying no ıe Burmese. An extreme freedom of mitted.

ɔovernment took a policy of encouraging ı the various races and political parties

per cent of the Burmese understand quite ıave no future if cast off by Japan and . . patiently lead them in the spirit of · brother.

\RY SECURITY AND : FIFTH COLUMN

ma's population live in the valleys of , Sittang, and Salween, and upon the They are a nonwarlike people, and circumstances Americans can count dship. The record shows, however, ·ercentage was willing to swallow the ɜ by the Japanese, and actively aided me the country was invaded. There ımn which pillaged the cities, harassed r and made retreat difficult, in marked the loyalty of the native military

uss military affairs with the people. ıestion you, act courteously but either ɔject or profess ignorance. . . . More ctions will be given by your com-

ɜ

eat basic difference in the pro-Japanese ɜurmese as compared to that of the Tais, on the British-Americans to the last ally came over to us during our military it of the Philippinos, who helped the mericans by fighting against us or the

(Continued on next page)

LIST OF MOTION PICTURE FILMS *(Continued)*

No.[1]	Title	Subject	Released	Running time (minutes)
MA-4586 TF 8-2057	Personal Health in the Jungle.	An Army Medical Corps training film designed to instruct all troops and personnel serving in the jungle, the treatment and sanitary measures for keeping physically well.	1944	15
MA-3819 TF 8-2057	Personal Health in Snow and Extreme Cold.	Outlines the techniques important for living in extremely cold area; how to wear specially designed clothing, use and care of equipment, personal hygiene techniques.	1944	20
MC-2480	Physiology of Anoxia	Inhalation therapy. Film should be of interest to all Medical Officers. Describes various types of anoxia.	1944	20
MB-1534 14C-779	Prepare for Ditching—Parts I and II.	Stresses importance of knowing in advance exact duties of each crew member when aircraft is forced down at sea. Shows procedure during drill and under actual conditions.	(2)	48
MA-2717 TF 1-3310	Radio Operator	An orientation film for aircraft radio operators giving a brief description of his training and emphasizing how it fits operators for active duty on bombardment aircraft.	6-23-43	20
MA-3172 TF 1-465	Sea Rescue Equipment for Airplane Crews—1 Man Sea Rescue.	Explains pneumatic life vest and one-man life raft. Stresses pre-flight inspection; precautions in inflating and before disengaging parachute harness from life raft.	9-17-43	13
MG-3324	Signaling Mirror	Describes the aiming principle, and steps in the operation of the tempered glass emergency signaling mirror (ESM/1) with the cross aiming device.	(2)	15
TF 7-678	Snow Camping Above Timberline.	Selection of campsite affording concealment from enemy; obscuring tracks when approaching camp location; duties of squad in grading campsite and pitching tent.	1942	42
MA-2123 TF 7-679	Snow Camping in Timber	How to select campsites and pitch tents in timber regions utilizing nature's resources. Illustrates proper clothing before and after exercise, cooking methods, and building fires.	1942	24
MA-2375 TF 1-486	Swim and Live	Demonstrates elementary swimming instruction and water safety methods. Depicts simple methods of staying afloat by use of clothing, barrack bags, and other equipment.	1942	19
MG-2063 MCG-115b-J	Swimming Through Burning Oil and Through Surf.	Swimming strokes and steps involved in escaping through burning oil surrounding a shipwrecked vessel, and do's and don't's for crossing heavy surf.	1943	9½
MN-16	Training Lookouts—Night Vision.	Demonstrates new methods for better night vision, stresses need for "dark adapting" eyes before going on night duty and shows techniques for conducting visual search at night.	1943	24

TRAINING AIDS AND PUBLICATIONS

No.[1]	Title	Subject	Released	Running time (minutes)
MN-942z	Troop Life Aboard Ship...	Illustrates conditions aboard ship as they appear to troops in transit. Discusses naval officers and their duties, procedure for abandoning ship and safety precautions to be observed.	1943.....	21
TF 1-3391	Your Safety Harness.....	Flight surgeon demonstrates safety precautions for pilots using safety belt and shoulder harness employing a dummy pilot simulating violent motion of a forced landing.	1944.....	18

[1] **Army designation:**

TF—Training film.
AF—Commercial and miscellaneous training films.

Navy designation:

1st letter:
M—Motion picture.
S—Film strip.

2d letter:
A—U. S. Army.
B—British.
C—Commercial film deemed suitable for Navy training.
G—Coast Guard or Government agency other than Army, Navy, Marine Corps, or Office of Education.
H—Marine Corps.
N—Made expressly for Navy training.

United Nations Central Training Film Committee designation:

TF—U. S. Army Signal Corps.
AF—U. S. Army Air Forces.
MN—U. S. Navy.
MC—Commercial (produced for U. S. Navy).
MCG—U. S. Coast Guard.
MTF—U. S. Marine Corps.
CA—Canadian Army Catalog Number.

[2] Information not available.

FILM REVIEW

OUTFITS FOR ACTION (

16 Mm. Running time: 35

Special suits for flying, ground crews, beachmen wh planes into the water, and n the women's division who wor are featured in this Canadian training film.

Other cold-weather clothi strated are gloves, boots, fly and goggles. The personal kit is shown strapped *under* suit.

Correct clothing for eacl proper fit and durability, is e The vast amount of technic and planning which deter preceding factors are covered through the laboratories, wh principles are applied. Goc clothing and equipment is nec film points out, to insure benefit from the combined eff laboratory experts.

This film is in technicolor, by the RCAF Medical bran junction with the Associate C on Aviation Medical Resear National Research Council and RCAF Clothing committ

BURMA HANDBOOKS (*Continued*)

Dutch, Malays, or the people of French Indo-China who have no patriotism.

This does not mean that we should not be on our guard against Burmese. They have been under the rule of Great Britain for a long time and it is extremely difficult to wipe out the British-American liberalism and materialism which has seeped in within a short period of time. There are some among them who believe the anti-Axis propaganda of victory and who entertain anti-Japanese thoughts. Some of them go to the extent of anti-Japanese activities.

Particularly under British-American rule there was free intercourse with India. . . . There are a great number of British-Indians, British-Burmese or British-Chinese persons of mixed blood. Britain and America are planning on utilizing these for espionage activities or for anti-Japanese propaganda. We should have it graven in our hearts that we should be careful of espionage.

With regard to the Burmese, who are lacking in the spirit of nationalism, who are sincere but very lazy, there is nothing more important than our goodhearted Japanese leadership in the future. By threading a path of sincere righteousness they will be won over to us and we should lead them along the path of this righteousness.

RULES OF CONDUCT

ARMY. "Your Special Orders"

1. To take charge of your health as never before in your lifetime . . .
2. To walk in Burma in a military manner, keeping always on the alert and respecting all rules and customs . . .
3. To report at once to the nearest medical station if you have risked your health . . .
4. To repeat all special warnings . . . to comrades whose sense of duty may be more distant from the spirit of the regiment than your own.
5. To quit Burma only when the distress of that country is properly relieved.
6. To receive, obey, and pass on t soldiers the spirit of the undertaking i are engaged . . .
7. To talk to no Burmans about you
8. To do those things which will wi and not spread alarm in case of disorde
9. To call upon your superiors for instruction in any situation not covere tions.
10. To evaluate the courage and the all forces and nations engaged with y country in the present undertaking, to worth according to their works and not their color, and to refrain from judging standards.
11. Be especially watchful at night.

CHECK LIST OF DO'S DONT'S

ARMY

Never fool with a water buffalo.

Soldiers are not expected to go aroun large trees . . . some of the Burmans v objects . . .

Take off those issue shoes before Burmese pagoda or other holy place .

Work through the village headman, permission to make camp, attend a fes any other action touching Burmese lif

(*Continued on next page*)

anything in pagodas, temples or
ıeir crumbling ruins . . .
to the Burman in his own language
picked up a few phrases . . .
rrun with dogs. The Burmans don't
)f them but they are resentful if any
ıts them . . .

' *"What the Burmese dislike*

pagodas. For instance going into the
's shoes on or using the temple for a

harsh use made of priests.
es at their women. Plundering and
reak down faith in the Imperial troops
ıification of Japan and Burma. . .
damage one's whole life by the feeling of

the open hand, particularly in public.

EALTH RULES

ıases are present in Burma, but you
n by following a few simple health
ree most common fever diseases are
) and a sandfly fever. The first two
ertain species of mosquitoes, the last
lfly. Sleep under mosquito netting
arms and legs covered at dusk.
iseases, relapsing fever and typhus,
lice. Give yourself a frequent once-
ın spread bubonic plague by biting
)d then biting humans. The plague
vive sunlight.
/ater are often contaminated with
ıntery. Diarrhea is the main symp-
eases. Do not eat raw fruits or vege-
hey have been peeled or washed in
Drink only boiled or chemically
, unless your sanitary officer okays
)ly. Tea is a refreshing beverage in
ut make sure that only pure water is
ıg it.
isease of the eye, called trachoma, is
tact. It can be picked up by using
infected person.

:—Sums Up in One Paragraph

alaria, cholera, the pest, dysentery and
ımic in Burma. In the case of malaria,
ıvoided by being careful of mosquitoes,
eventive medicines and by an examina-
rly stages. In addition, preventative
e taken by giving shots, by not eating
r or foods, and by avoiding getting cold

NEREAL DISEASE

ake chances with your health . . . take
utions which will cut risks to a mini-
ıereal diseases are always prevalent
ıntries. They will be more so in a
women have been used by the sol-
my in any way that they pleased.

ıses are very prevalent, and as there are
extremely bad one should be circumspect
his actions for the benefit of his country

PUBLICATIONS CATALOGUED

Air Sea Rescue Technical Library

(7 February–7 March)

THESE PUBLICATIONS ARE NOT AVAILABLE FOR DISTRIBUTION BY THE AIR SEA RESCUE AGENCY.

EMERGENCY EQUIPMENT

Marine Aircraft Experimental Establishment, *Helensburg.*
. . . *Tests of Scotchlite Reflecting Material* (with reference to air/sea rescue equipment) Report no. H/Ec/268, 28 August 1944.

Naval Medical Research Institute, *Bethesda, Md.*
Improvised Stokes Stretcher Floats for Air/Sea Rescue. Its Research Project X-109A, 5 December 1944.
. . . *Test of Performance of an Improved Delano Sunstill on Land.* Project NMRI-24, 11 October 1943.

U. S. Army Air Forces.
. . . *Kit; Sea Water Desalting, Type JJ-1.* Specification no. 40874, 6 December 1944.

U. S. Coast Guard. 5th Naval District. Medical Office.
. . . *Improvised Stokes Stretcher Floats for Sea Rescue.* Dated: 10 January 1945.

U. S. Naval Air Station, *Patuxent River, Md.*
. . . *Emergency Hat, Head Net, Water Bottle Combination* (Strato-Equipment Co.) *Test of.* Feb. 8 1944. TED no. PTR-2512. (Restricted.)

HEALTH AND MEDICAL INFORMATION

. . *Smoke Materials.* (Chapter III, Funnnel Smoke) At Head of Title: Chapter II.

U. S. Naval Air Training Center. School of Aviation Medicine, Pensacola, Fla.
Research Reports: X-322 (AV-183-f) Final . . . Evaluation of Gosport Speaking Tube . . . -X-323 (AV-184-f) Report no. 2. . . . The Accuracy of the Scholander Nitrogen Method in the Analysis of High Oxygen-Low Nitrogen Gas Mixtures at Sea Level and at Altitude . . . -X-323 (AV-184-f) Report no. 3. . . . The Determination of Arterial Carbon Dioxide Content from Samples of "Capillary" Blood . . . -X-323 (AV-184-f) Report no. 4. . . . Arterial Oxyhemoglobin Saturations at Critical Pressure—Altitudes Breathing Various Mixtures of Oxygen and Nitrogen (With a Note on the Effect of Exercise) . . . -X-324-(AV-185-f) Report no. 1. . . . Peak Rates of Oxygen Flow from Oxygen Supply Systems . . . -X-402 (AV-216-f) Rep rt no. 1. . . . Individual Variation in Respiratory Response to Carbon Dioxide at Altitude . . . -X-422 (AV-226-f) Report no. 1 (Final). . . . Evaluation of Pocket Size Oxygen Mask Leak Tester Manufactured by McKesson Appliance Company . . . -X-431 (AV-228-f) . . . Breath Holding at Altitude and Breath Holding as a Demonstration of Anoxia . . . -X-499 Report no. 1. . . . Evaluation of Pocket Mask Leak Tester (Leak Tester, Demand Oxygen Mask, Buaer M-117) Made by Master Plastics Corp. . . . -X-454 (AV-237-f) Report no. 1 (Final) . . Hyperventilation Breathing Air as a Means of Maintaining "Consciousness" at 25,000 Feet .

U. S. Navy Yard. Naval Ordnance Laboratory, Washington, D. C.
. . . *Specifications to Govern the Manufacture, Assembly and Inspection of Night Drift Signal A M Mk. 5 Mod. 1.* Washington, D. C., 1943. (Restricted.)

Wall, Carl B.
Captain of His Fate. From: Reader's Digest, July 1944, p. 45–48.

LIFE RAFTS AND LIFEBOATS

U. S. Army Air Forces. Proving Ground Command. *Eglin Field, Fla.*
Final Report on Test of One (1) Man Parachute Type Pneumatic Raft . . . 12 June 1943. (Restricted.)

U. S. Navy. Aviation Supply Office. *Philadelphia, Pa.*
. . . *Life Rafts and Equipment* . . . At head of title: Catalog of Aeronautical materials, spare parts and equipment, Class 83 . . . January 1945. (Restricted.)

NAVIGATION

U. S. Army Air Forces. Office of Flying Safety.
Navigators Information File. (Restricted.)

NAVY ADDS LIFE RAFTS AND EQUIPMENT TO CATALOG

A section on "Life Rafts and Equipment" (Class 83) has been issued by the USN Aviation Supply Office, Philadelphia, to be added to the *Catalog of Aeronautical Materials, Spare Parts and Equipment.*

It is an indexed, illustrated compilation of life rafts and equipment, with a summarized description of each item, including stock and specification numbers. This edition supersedes the preliminary edition of December 1943.

List Of Effective Technical Orders Relating To Army Air-Sea F Equipment And Techniques Compiled In Number Order

Army Air Forces Technical Orders are directives published by command of the Commanding General of the Army Air Forces for the purpc ing special instructions and information of a technical nature.

Active Technical Orders are revised from time to time to keep them up to date and to combine, whenever possible, each group of related s one Technical Order. Notification of new issues, and of those revised, rescinded, or replaced are published in an index issued monthly.

The following is a list of Army Air Forces Technical Orders prepared as of 1 February, 1945, applicable to life rafts, life raft stowage, iten and sustenance equipment. Several blank spaces are provided at the end of this list so that Technical Orders issued at a later date may be ad

Technical Order No.	Title	I
00-30-51-1	Kit, Jungle Emergency	22 F
00-30-139	Kit, Medical, First-Aid Kits and Packet	13 N
00-30-145	Kit, Parachute Emergency	17 F
00-35A-25	Medical Supplies Peculiar to Army Air Forces	1 S
00-35A-36	Special Rations	21 N
01-1-38	Use of Smoke Grenades—HC AN-M8, AN-M3	10 C
01-1-117	Installation, Use and Inspection of First-Aid Aeronautical Kits	3 I
01-1-122	Inspection of Emergency Exits	15 A
01-1-210	Identification Markings for First-Aid Kits	16 J
01-1-212	Emergency Entry Into Aircraft for Rescue Operations	15 I
01-1-216	Modification Inspection Windows in Life Raft Compartment Covers	19 J
01-1-222	General-Conversion of 75-Gallon Auxiliary Metal Fuel Tank into Fighter Rescue Gear.	30 J
01-5-118	Addition of "Ditching" Ribs for Bomb Bay Door Reinforcement—RB-24, AT-22, F-7 PB4Y-1 Series.	25 J
01-5-118A	Addition of "Ditching" Ribs for Bomb Bay Door Reinforcement—RB-24, B-24, TB-24, F-7, PB4Y-1 Series.	1 C
01-20-10	Modification of Life Raft Door Latch and Installation of Decalcomania-B—17F, B-17G, YB-40, F-9 Series.	26 F
01-20EF-62	Replacement of Life Raft Attachment Line—B—17F	2 I
01-20EJ-106	Installation of Life Raft Release Instruction Decalcomania—B-29	29 I
01-35E-102	Modification of Life Raft Installation—B-26B, B-26B-1, Series and TB-26, B-26C, B-26F and JM-1.	8 J
03-55A-2	CO_2 Inflation Equipment-Instruction for Inflation and Valve Assembly—Type A-2 Raft-Walter Kidde.	8 J
03-55A-3	Installation of Locking Clamp—CO_2 Cylinder	27 C
03-55A-4	Handbook of Instructions With Parts Catalog—CO_2 Cylinder and Valve Assembly (Rev. 15 Aug. 1942).	10 J

TRAINING AIDS AND PUBLICATIONS

ıl Order No.	Title	Date
----------	CO_2 Inflating Equipment-Modification of Life Raft Valves, Fabrication and Use of Torque Wrench Adapters.	19 Feb. 1944
----------	Charging of Cylinders for Extreme Temperature Operation	11 Dec. 1944
----------	Distribution, Inspection, Installation and Maintenance of Type E–2, E–2A, A–3, A–3A, Life Rafts.	15 Aug. 1944
----------	Use, Maintenance, and Inspection of One-man Parachute Type Pneumatic Rafts	18 Sept. 1942
----------	Use, Maintenance and Inspection of One-Man Parachute Type Pneumatic Rafts	28 Dec. 1942
----------	Use, Maintenance and Installation of Accessories	21 Oct. 1943
----------	Inspection and Modification—Type A–3	20 Dec. 1943
----------	Inspection of Hand Pump—Types A–2, –3, E–2 Life Rafts	28 Mar. 1944
----------	Replacement of Type A–2 Life Rafts and CO_2 Cylinder Assemblies	25 Sept. 1944
----------	Modification of Type C–2 One-Man Parachute Life Raft Pack	18 Nov. 1944
----------	Type AN–M8 Pyrotechnic Pistol	21 Jan. 1943
----------	Signal Flare Container, Types A–5, A–6, A–7, and A–8, and Pyrotechnic Pistol Holder Type A–2.	27 Dec. 1944
----------	Life Preserver Vest—Types B–3, 4	27 Sept. 1944
----------	Addition of Sea Marker Packet to Life Preserver Vests	23 Nov. 1943
----------	Modification of B–3 and B–4 Life Preserver Vests	25 May 1944
----------	Attachment of Types B–2, B–4, C–1 Parachute Emergency Kits	5 Sept. 1944
-94-------	Handbook of Maintenance Instruction for Radio Set—SCR–578–A or SCR–578–B (Rev. 23 March 1944).	2 Jan. 1943

U. S. GOVERNMENT PRINTING OFFICE: 1945

COMMITTEES FOR AIR SEA RESCUE

1. **Committee to Study the Preparation of Emergency and Survival Publications.**

(Chm)	CG:	Lt. J. H. Bell, USCGR, 1516 14th St. NW.	ADams 2003
	Army:	Capt. Thomas Dunn, AC, Room 4E 144, Pentagon Bldg.	Army 73050
	Alt:	Maj. K. O. Bennington, AC, Room 4E 144, Pentagon Bldg.	Army 74687
	Navy:	Lt. Comdr. Norville E. White, USNR, 2W30 Bg–W, Navy Depart.	Navy 4038 or 62953

2. **Committee to Study Adequacy of Air Sea Rescue Facilities.**

(Chm)	CG:	Comdr. A. E. Harned, USCG, 1516 14th St. NW.	ADams 2003
	Army:	Maj. T. J. Borgman, AC, Room 4E 144, Pentagon Bldg.	Army 73538 or 71629
	Alt:	Maj. William J. Small, AC, Room 4E 144, Pentagon Bldg.	Army 73538
	Navy:	Lt. C. W. Brown, USNR, Room 1634 Temporary S. Bldg., 5th and Independence, SW.	Navy 61178

3. **Committee to Study the Communication Facilities and Requirements for Air Sea Rescue.**

(Chm)	CG:	Capt. E. M. Webster, USCG, Room 7300, CG HQ.	Navy 4444
	Army:	Maj. J. M. Sherman, AC, Room 4E 144, Pentagon.	Army 4847
	Alt:	Maj. T. J. Borgman, AC, Room 4E 144, Pentagon Bldg.	Army 73538 or 71629
	Navy:	Comdr. C. L. Harding, USCG, 2542 Navy Depart.	Navy 63636

4. **Committee to Study Special Aircraft Equipment for Rescue and Survival.**

(Chm)	CG:	Lt. Comdr. J. D. McCubbin, USCG, 1516 14th St. NW.	ADams 2003
	Army:	Capt. Wilfred Hines, AC, Room 4E 144, Pentagon Bldg.	Army 74687
	Alt:	Capt. Knute Flint, AC, Room 4E 144, Pentagon Bldg.	Army 73538
	Navy:	Lt. R. J. Willingham, USNR, 2W32 Bg–W Navy Depart.	Navy 62292 or 62953.

5. **Committee for Life Saving Equipment on Transports.**

(Chm)	CG:	Comdr. R. A. Smyth, [illegible]	Navy 4374 or 4381

5. **Committee for Life Saving Equipment—Cont**

	Army:	Major G. L. Johnson, Room 1E 668, Pentagon Bldg.	A
	Army:	Mr. Phillip E. King, 3C 738, Pentagon Bldg.	A
	Navy:	Lt. Comdr. J. L. Caillouet, Jr., USNR, Rm. 2011, Bg–T5, Navy Depart.	N

6. **Committee to Study the Medical and Physi pects of Air Sea Rescue.**

	CG:	Sr. Surgeon Paul A. Neal, USPHS, National Hygiene Research Lab., National Institute of Health, Bethesda, Md., Room 12.	W
	Army:	Maj. Frederick Fink, Office of Surgeon General, Room 422, 1818 H St. NW.	A
	Army:	Col. E. J. Tracy, Office of Air Surgeon, Room 4C 148, Pentagon Bldg.	A
	Alt:	Maj. Richard Follis, MC, Asst. Chief, Medical Safety Div., Office of Flying Safety, HQ, AAF, Winston-Salem, N. C.	
(Chm)	Navy:	Comdr. Owen W. Chenault (MC), USN, Room 2906 Navy Depart.	N
	Alt:	Lt. Comdr. Henry A. Schroeder (MC), USNR, Room 2906 Navy Depart.	N
	Alt:	Capt. John H. Korb (MC), USN, Room 28, Pot-Ann Bg–3.	N
	RAF:	Wing Comdr. P. A. Lee, 1424 16th St. NW.	D

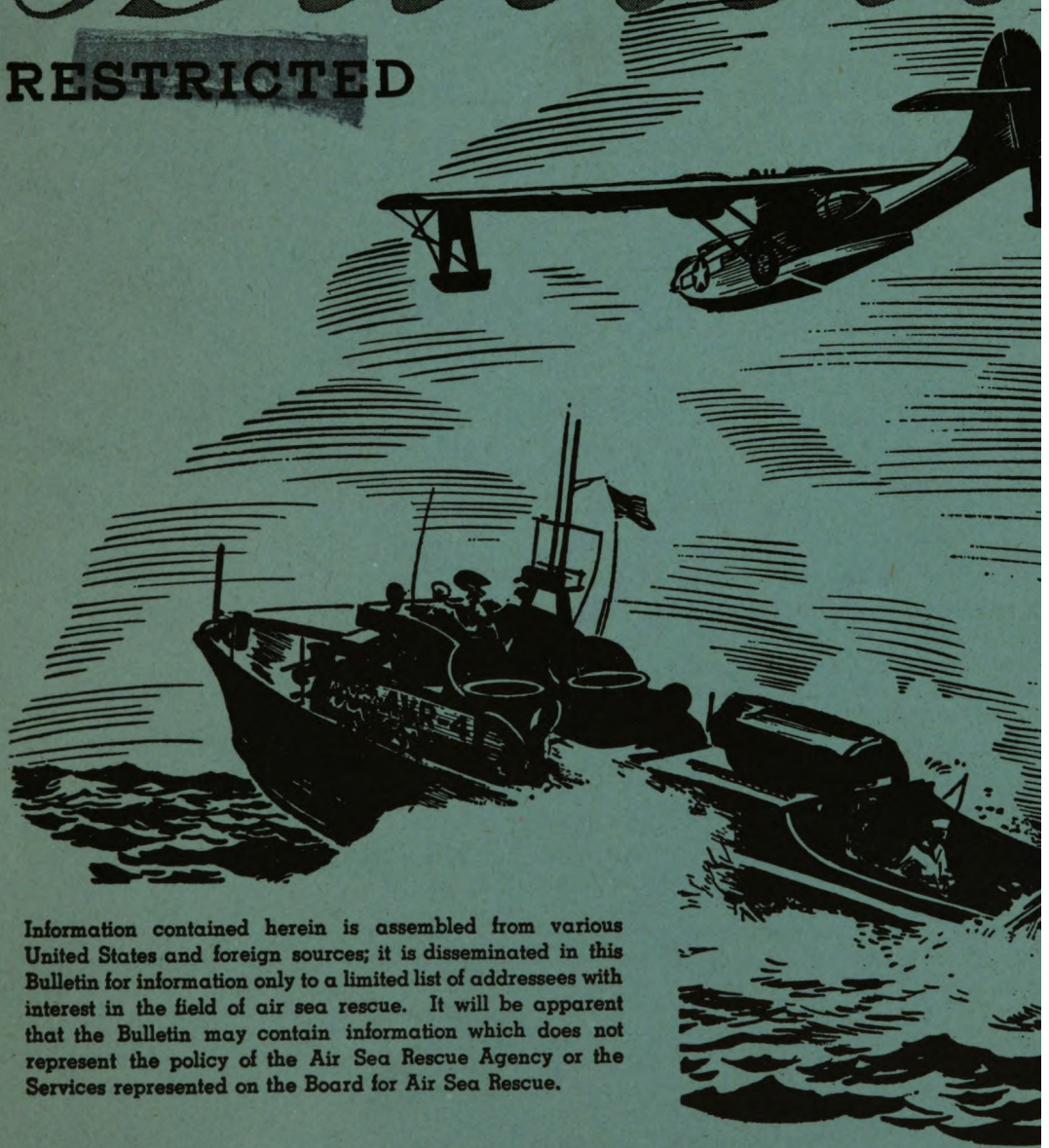
7. **Committee to Study Ditching Procedures.**

(A. Chm)	CG:	Comdr. A. E. Harned, USCG, 1516 14th St. NW.	A
	Army:	Maj. K. O. Bennington, AC, Room 4E 144, Pentagon Bldg.	A
	Alt:	Capt. Thomas Dunn, AC, Room 4E 144, Pentagon Bldg.	A
	Navy:	Lt. Comdr. Joseph W. Runyan, USN, Room 2906, Navy Depart.	N
	RAF:	Wing Comdr. R. Bicknell, 1424 16th St. NW.	D

AIR SEA RESC

Bulleti

RESTRICTED



Information contained herein is assembled from various United States and foreign sources; it is disseminated in this Bulletin for information only to a limited list of addressees with interest in the field of air sea rescue. It will be apparent that the Bulletin may contain information which does not represent the policy of the Air Sea Rescue Agency or the Services represented on the Board for Air Sea Rescue.

Published monthly by the United States Coast Gua

AIR SEA RESCUE AG

WASHINGTON, D. C.

No.

AIR SEA RESCUE AGENCY

R. R. WAESCHE, Vice Admiral
U. S. Coast Guard

W. A. BURTON, Commander, U. S. C. G.
Executive Assistant to Head of Air Sea Rescue Agency

BOARD FOR AIR SEA RESCUE

C. V. WHITNEY, *Colonel*, U. S. Army Air Forces
J. W. BURGARD, *Lieutenant Colonel*, U. S. Army Air Forces
W. J. RENN, *Lieutenant Colonel*, U. S. Army Service Forces
JAMES R. DUDLEY, *Captain*, U. S. Navy
PAUL FOLEY, JR., *Commander*, U. S. Navy

Special Duty Staff Officers, Air Sea Rescue Agency

A. C. HOHN, *Commander* (MC) USN
C. M. MURPHY, *Major*, AC, ATC, Army of United States
RUSSELL E. PIERCE, *Captain*, USMC (R)
E. J. SANGER, *Lieutenant*, USNR

AIR SEA RESCUE LIAISON OFFICERS

T. J. HARRIS, *Commander*, USCG
Air Sea Rescue Liaison Officer
% Commander Western Sea Frontier
Federal Office Building, Room 480
San Francisco 2, Calif.

A. J. HESFORD, *Commander*, USCG
Air-Sea Rescue Liaison Officer
Commander U. S. Naval Forces in Europe
% Fleet Postmaster
New York, N. Y.

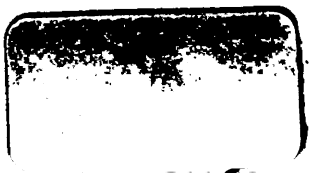
C. B. OLSEN, *Commander*, USCG
Air Sea Rescue Liaison Officer
% Commander South Pacific Force
% Fleet Post Office
San Francisco, Calif.

R. L. BURKE, *Commander*, USCG
Air Sea Rescue Liaison Officer
Commander Eastern Sea Frontier
90 Church Street
New York 7, N. Y.

E. E. FAHEY, *Commander*, USCG
Air Sea Rescue Liaison Officer
% Major P. Kraus
% Postmaster A. P. O. 925, HQ AAF
San Francisco, Calif.

J. F. HARDING, *Commander*, USCG
Air Sea Rescue Liaison Officer
% Commander Gulf Sea Frontier
Dupont Building, Room 926
Miami, Fla.

W. B. SCHEIBEL, *Commander*, USCG
Air Sea Rescue Liaison Officer
Coast Guard Box #1, Navy 48
% Fleet Postmaster
San Francisco, Calif.



CONTENTS

Communications to Air Sea Rescue Bulletin should be addressed:
Air Sea Rescue Bulletin
AIR SEA RESCUE AGENCY
1516 Fourteenth Street N.W.
Washington, D. C.

(SEE BACK PAGE OF COVER)

Open Sea Rescue

The back cover photograph was taken during the rescue of two airmen forced down some 100 miles off the southern California. After locating the survivors, the rescue plane landed in seas of 8 feet in order to effect the A close scrutiny of the picture will show the excellent technique employed by the pilot of the rescue plane. I to bring the survivors alongside without danger from the props, the pilot has cut his starboard engine. To permit an approach to the survivors on a straight line and into the wind, a drogue has been streamed from the port blister. too, that a crew member stands ready at the starboard blister with a ring buoy on a heaving line to be tossed to the su as they drift alongside

PHYSIOLOGICAL ASPECTS OF SURVIVAL AND RESCUE

ert Consensus Solicited U. S. Navy, Army, Public th Service, and National ırch Council

reports on physiological aspects ɔlems in air-sea emergency search escue have been submitted by ttee groups appointed from repre- ives of interested Allied Serv- They may be regarded as a sus of experts solicited for the a Rescue Agency from the United Army, Navy, Public Health Serv- d National Research Council.

reports were accompanied by a t that they be submitted to the for Air Sea Rescue for approval, the Air Sea Rescue Agency and tional Research Council for pub- n.

ects covered by the reports in- risual problems of air-sea search, ft drinking water requirements, sickness remedies, life raft ra- quirements, effects of cold on sur- and life raft first-aid kits. Texts reports follow:

UAL PROBLEMS OF SEARCH

following statements are tenta- ınd they are based more upon tical considerations than upon the ıation on actual search opera- vhich is now accumulating.

ɔrted experience of rescue in the h Channel places the optimal alti- or finding rafts at from 800 to 'eet, and for finding a man in a cket at from 400 to 500 feet. It be remembered that in usual vis- ıity tests the 20/20 objects or let- re one-twelfth degree in over-all This is all right for tests but too for effective search. The appar- e of the moon is one-half degree, is a larger target than necessary ɔea search. *The usual raft viewed ı distance of 800 to 1,000 feet subtend one-sixth to one-third de- ıt the observer's eye. This is believed to be a practical target size.* At the 800-foot altitude the sea should be searched for about a thousand yards to starboard and port of the ship. Under favorable conditions life rafts will probably be visible for greater distances than 1,000 yards, but when such an object is sighted, it is difficult to keep it in view at a greater distance than a thousand yards from the observer.

A man in the sea supported by a life jacket even under excellent conditions of visibility is not likely to be spotted at an altitude greater than 400 to 500 feet, and at a lateral distance greater than 500 yards. Under conditions of poor visibility due to mist or decreased illumination, as in morning or evening, the search elevation should probably be reduced to 500 feet when looking for rafts, and still lower than that when looking for single individuals supposedly afloat at sea.

If the search is made on a clear night and the survivors may be expected to use lights as signals, then the preliminary search should take place from an elevation of 2,000 feet or greater and the lateral horizontal distance covered can of course be greatly increased over daytime distances.

If the signaling mirror is used in the daytime, it may be effective in attracting the attention of the searching crew at distances of 6 or 7 miles. The searching crew should be alert to flash signals but should not count too heavily on these signals and so dispense with their own routine visual searching methods at an altitude of 800 to 1,000 feet.

Searching into the direct path or glare of the sun on the sea in the daytime is ineffective without suitable dark goggles. The excessive sunlight reflected from the water tends to blot out a small darker area such as would be formed by the raft. Observers should therefore endeavor to search given areas of sea when these are free from bright reflections of sunlight. On the contrary, the glare of the moon on water gives a favorable area in which to search for an item such as a raft.

Reports on Problems in Vision, Water, Motion Sickness, Rations, Exposure, and First-Aid Kits

The variable density polaroid goggles could be used by the observer who has the glare of the sun in his particular sector. Other sun glasses used for searching this area should probably have a transmission of around 10 percent and should be of neutral density or green. As far as possible it is, of course, desirable to so arrange the path of search as to reduce the difficulty of sun glare especially for the nose and tail observers.

If it is true that, as sometimes reported, the tail observer is more likely than the nose observer to locate survivors, this problem deserves careful study. It may be that the nose observer, due to limitations of vision prescribed by the plane, tends to look too far ahead. The raft or visual target, because of distance and foreshortening, is therefore almost too small to be detected. The tail observer from a more favorable position in the plane may be able to look at sea area when it is relatively near him and the size of the visual target larger. There is one other point that favors the tail observer. Survivors in a raft may be taken unawares by the rapid approach of the searching plane and not make use of their signal devices early enough to have them detected by the nose observer, whereas the tail observer has a chance of seeing these delayed signals.

If the observers have had some training and the seeing conditions are favorable, good visual efficiency can probably be maintained for 2 to 3 hours. Efficiency depends to a large extent on training and experience and on physical conditions. The following factors may be enumerated: (1) The glass or plastic windows through which the observer views the sea-scape should be clean and if possible free from scratches. Efforts to observe through a dirty, scratched window bring annoyance and frustration to the

322348—45

observer. (2) Familiarity with the appearance of the visual target should be sought. If an observer has never seen a raft or dinghy on the water from an altitude of 800 to 1,000 feet, or has never seen a man in the water supported with a life belt, he is at a disadvantage as a searcher in an emergency. Practice is an important factor. (3) Observers should avoid staring. They should use their eyes in a natural, comfortable manner and not suppress normal blinking. Suppression of blinking tends to produce feelings of eyestrain, smarting, and also blurring of vision. Fairly frequent head movements and changes of posture tend to relieve eyestrain. (4) The number of observers should be as large as the searching plane can accommodate. Each observer should be assigned a restricted sector to cover. Observers should be shifted, from one sector to another, at intervals of 30 minutes to 1 hour. Reducing the sector that a man is to cover will increase the chances of successful spotting. Changing position, for example, from the starboard to the port side of the plane, will tend to relieve fatigue from the after effects of the movement of the view across the visual field. (5) Intercommunication between observers during searching probably tends to increase efficiency and to reduce fatigue.

SCANNING PATTERNS

Routine scanning patterns should be used.—In general the eyes should move and pause for each 3° or 4° of lateral or vertical distance, and at such a rate as to cover about 10° per second of time. The course of the plane moves the field of view along one axis so that it is not necessary or desirable for observers to look forward and backward along the axis represented by the course. Rather the observer should explore at right angles to that axis. The positions of the nose observer and the tail observer are ideal for this purpose. The position of the waist observers are not so ideal, but their observation routine should make use of this same principle, that is, they will use mostly up and down head and eye movements as the field drifts past them. In general the observer who is searching for a raft or a man is performing a similar task to that of the proofreader. But whereas the proofreader, as a rule, hunts from left to right, and from top to bottom, the air-sea observer will hunt from left to right and from right to left alternately, or from bottom to top and top to bottom. Spotting is much more likely to occur in an area limited by a 5° radius in all directions from the fixation point at which the eyes are focused than it is over an area represented by a 10° radius from this point. Therefore, the good observer does not jump his eyes too far between fixations, and he pauses them only briefly at each fixation. The foregoing applies to searching in daylight. If the search is being carried out at night with the expectation of finding light signals then the eyes need not pause so frequently in sweeping the visual field to the right or to the left and the observer need not so consistently limit himself to making lateral eye movements; he will now and then look ahead and look back, look far and then near. The good observer adopts a routine by which he covers his sector systematically and brings every portion of it to view in the central part of his own visual field successively at intervals of a few seconds. For example, he takes a look at the extreme right-hand side of his sector about every 3 or 4 seconds. As he moves his eyes back and forth, right and left, the fixation or focus points if plotted on the sea, would represent a series of notched diagonal lines composing a pattern like coarse saw teeth. The vertical distance separating the tips of the teeth at the right and left of this diagram should not become greater than 10°.

These recommendations are based on the expectations that the plane searching the area will go back and forth along parallel paths about 1 mile apart. After completing several such short courses the entire area would be circled and then crossed and recrossed by parallel paths in the opposite axis.

Lights and flares are the signals most easily detected at night, and reflected sunlight as from a mirror the most easily detected signal in daytime. Unfortunately these signals depend largely on the cooperation and alertness of the men who are in the raft and are hardly available to a man who is in a life jacket.

The effectiveness of various types of signals such as lights, the fluorescein block, the whistle, the emergency radio, and so on, should be assessed in terms of the reports of actual rescues.

Under favorable conditions when loss of water from the body is at a minimum and shivering does not occur, one can survive without water f before becoming prostrated. tional 5 days will pass before curs.

LIFE RAFT DRINKING W

Under conditions of minim loss, an individual consuming grams a day of a food cons carbohydrate and up to 20 p will not become severely dehy at least 8 days if supplied wi of water a day. Given the sam of food, a water supply of 800 will provide for water needs in under these conditions. In the of complete starvation, the quirements are slightly augme

It seems likely that loss may tained at a minimum in all ocean areas by observing the procedures:

1. Preventing vomiting.

2. Minimizing evaporative by:

a. Refraining from unnec ertion.

b. Exposing the body, a protected against sunburn, breeze as much as possible.

c. Shading the body from without simultaneously cutti breeze.

d. Keeping the clothing sea water in the daytime.

Procedures 2*b* through 2*d* discontinued when sensations ness intervene since cold and c shivering expedite exhaustion water to be lost from the body sarily.

There should be made availal rafts, from all sources a minim to 800 cc. of water per man p the estimated maximum numb before rescue. Rain catchme ment should also be provided

As regards the proper proc rationing water, uninjured should drink no water the Thereafter, if the supply is water should be consumed at t 500 cc. per man per day until ply is exhausted. When finally remains, individuals can survi additional days, providing that very start the survivors mai necessary water loss from the minimum by using the proce ommended in an earlier par this section.

siologically it is permissible to
:nt a supply of fresh water by di-
4 parts of fresh water with 1 part
ı water. Whether it is desirable
this in general practice is open to
on. When the supply of water is
imited, it seems desirable to ad-
he ingestion of fresh water which
)een inadvertently contaminated
sea water, as long as ingestion of
ontaminated water does not give
) gastrointestinal symptoms.
: urine excreted during the first 2
at sea may be diluted enough to
le usable water. The quantity of
)logically useful water so obtained
ignificant, however. The possibil-
causing nausea contraindicates the
lure.
the absence of vomiting, the oral
ıistration of any fluid is more effec-
han any other route, such as the
n.
regards the acceptable salt content
ter obtained from desalination kits
iolar stills, the evidence which is
ıble at present indicates that gas-
:estinal symptoms will not result
the ingestion of 500 to 800 cc. a
f water containing in each 100 cc.
n. of the mixture of solids found
ı water. Water of this composition
prevent dehydration of the body.
e are now in progress additional
iments upon this question of the
ologically acceptable maximum
ntration of solids in water for use
rvivors.

OTION SICKNESS REMEDIES

number of organizations in the
:d States, Canada, and Great Brit-
ave been studying motion sickness
lies of various kinds. The follow-
hree remedies have been shown to
ective, and there is no evidence that
one is better than any of the
s:

- *MSP (U. S. ARMY):*
  Atrophine SO_4, *0.32 mgm.*
  Hyoscine HBr, *0.43 mgm.*
  Sodium amytal, 130 mgm.
  (Half dose repeated in 8 hours.)
- *RCN (CANADIAN):*
  Hyoscine HBr, *0.32 mgm.*
  Hyoscyamine HBr, *0.87 mgm.*
  Niacin, 150 mgm.
  (Half dose repeated in 8 hours.)
- *HYOSCINE (BRITISH):*
  Hyoscine HBr, *0.65 mgm.*
  (Dosage repeated in 8 hours.)

Furthermore, none of these remedies can be expected to be effective every time, nor can it be predicted whether or not a given remedy will prevent seasickness in a given individual at any time. *These remedies are generally considered to be 50 percent effective; however this percentage cannot be taken as a reliable figure because the conditions producing motion sickness vary greatly from one case to the next.* These conditions include roughness of the weather, type of vessel or life raft used, the general physical condition of the subject, the type of food he has eaten, psychological conditions such as fear or excitement, etc.

Because a simple drug is more practical from the point of view of procurement than a remedy having a more complicated formula, it is felt that hyoscine is probably slightly more desirable than either of the other two mentioned. There is no evidence, however, that hyoscine is a more effective or a less effective remedy than the others.

LIFE RAFT RATIONS

Because of limitations of space, no more than a fraction of the approximately 2,000 calories per day needed by a castaway can usually be provided in an emergency ration. *A daily intake of 75 to 125 grams of a food constituted of carbohydrate and up to 20 percent fat effectively spares body water and tissue and hence should be included in raft kits.* Up to 125 grams per day of such a ration is more than its weight in water.

On the basis of the information now available and for several practical reasons it would seem inadvisable to include more than 25 percent fat in a ration for use on lifeboats and rafts. Except as a matter of palatability, protein should not be contained in an emergency ration for these craft. Addition of protein in order to increase palatability is at the expense of the more physiologically economical carbohydrate. The concentration of any flavor should be minimal and a variety of flavors should be provided, if possible. The vitamins available today merely stimulate the morale so far as castaways at sea are concerned.

EFFECTS OF COLD ON SURVIVORS

1. (*a*) Summary of the effects and tolerance limits of exposure to cold.

Standards are set up on the basis of the reactions of individuals to moderate cold and to the extreme cold used in hypothermic treatments. On the basis of the normal insulating value of the body tissues the rates of cooling of subjects immersed in water are estimated for conditions in which the rate of heat production averages 1 met.* The rate of heat production which would be needed to maintain a heat balance is also indicated.

Effects of cold.—*Sudden immersion in extremely cold water (below 50° F.) is very painful and may cause fainting. Fall of rectal temperature below 92° F. is accompanied by semiconsciousness and loss of memory, as well as with failure of the thermoregulating mechanisms of the body. Fall of rectal temperature below 80° F. is apt to cause death though temperatures as low as 74° F. have been recorded with survival. Cold itself does not cause shock, though shock is induced if the subject is warmed unduly rapidly. A rate below 2° F. per hour is recommended which implies warming the surface to a level only slightly above that of the rectum.*

IMMERSION NUDE IN WATER AT 32° F.

Heat production needed to maintain thermal balance: 5.5 mets.*

Probable time interval to unconsciousness to fatal hypothermia: ½ hour or less.

Complications—fainting reactions, 1½ hours.

IMMERSION NUDE IN WATER AT 60° F.

Heat production needed to maintain thermal balance: 2.8 mets.*

Probable time interval to unconsciousness: 1 hour after too fatigued to remain active.

Probable time interval to fatal hypothermia: 4 hours after too fatigued to remain active.

IMMERSION NUDE IN WATER AT 80° F.

Heat production needed to maintain thermal balance: 1.5 mets.*

Probable time interval to unconsciousness: 4 to 8 hours after too fatigued to remain active.

Probable time interval to fatal hypothermia: Indefinite; death likely to be due to secondary factors.

IMMERSION HEAVILY CLOTHED

No significant difference from the nude values.

ESCAPE OF CLOTHED INDIVIDUAL

Water retained in clothing likely to amount to at least 6 pounds. To evap-

(Continued on page 16)

*One met is defined as the amount of heat lost per hour by a lightly clothed man at a room temperature of 70° F.

LANDPLANE DITCHING

Part III—Ditching Safety in Transport Landplanes

[EDITOR'S NOTE.—The following is taken from the Landplane Ditching Staff Instruction Manual prepared by the Air Sea Rescue Agency Committee to Study Ditching Procedures. Part I, Landplane Ditching Technique, appeared in the No. 4 issue of the BULLETIN, and Part II, Factors Which Determine Ditching Characteristics, was published in the No. 5 issue. This chapter has been written as "food for thought." The committee realizes that the study of the future design of aircraft is highly controversial.]

Today the design and construction of aircraft has not achieved mechanical perfection, nor are the pilots and crews sufficiently able to master all unfavorable circumstances which they may encounter in flight. It cannot be predicted that even within another century all the hazards of air travel will have been mastered. Therefore, until such perfection can be reached, a means for increasing the safety of air passengers during ditching or crash landing must be developed.

The wealth of experience gained in this war by rescue services is already returning dividends. In the early days of the war, operational requirements of military aircraft restricted the improvements in design which would relieve ditching and crash landing hazards. In a large measure such restrictions do not apply to civil transport aircraft. The air transport services do have a fine safety record, but these services have had their losses excluding those by enemy action.

The trend toward air travel in the future is a popular topic of the day. But, this mode of travel still must be "sold" to the public. It has many attributes: (1) It is very comfortable, (2) it is fast, (3) for the first few flights at least it is an interesting experience, and (4) for the service it gives, rates are remarkably moderate. However, in relation to other forms of travel, such as automobile, train, and bus, it is, in the opinion of the ordinary man, still a hazardous means of transportation. This is because the few accidents that do occur to both civil and military transport planes are splashed across the front page of newspapers in all their lurid detail. Such news accounts are not conducive to winning public confidence in post-war aviation.

The wartime morale of our airborne personnel has increased considerably by the successful efforts of the rescue services. Effective civilian rescue will likewise improve passengers' confidence and is a good sales talk for the safety of future transoceanic air commerce.

However, if accidents are inevitable, much can be done to make these accidents far less unpleasant without undue effort or sacrifice in pay load. Passengers must be prepared so they will act without panic in the event of a forced descent. Airlines cannot afford to intimidate their passengers, so finesse and subtlety must be used when designing gear and giving safety instructions.

The following has been written to show what preparations can be made at present and in the future when control is lost, in spite of highly efficient aircraft and flight safety regulations.

In Parts I and II of the LANDPLANE DITCHING MANUAL, ditching military aircraft in respect to handling technique, ditching drills, and design improvements compatible with operational requirements is discussed. Handling techniques for transport aircraft are identical to those for bombers; design improvements are similar but not identical, whereas ditching drills differ because the passenger element presents a more complicated problem. This chapter concerns the civil transport aircraft in particular, but obviously the conclusions drawn also apply to military air transports. It is consistently borne in mind that improvements in design and installation of safety equipment to cover ditching must not unduly prejudice pay load.

Transport aircraft ditching safety is divided into the following essentials:

1. Hydrodynamically favorable shape and strength of aircraft.
2. Installations to protect personnel against high deceleration.
3. Provision of adequate exits.
4. Provision of life-raft and other survival gear.

HYDRODYNAMICALLY F A ABLE SHAPE AND STREN

Favorable hydrodynamic strei shape of aircraft have already l cussed in relation to bombers, conclusions drawn also apply la transport aircraft. The main tage of the transport over the is the absence of vulnerable bom However, recent trend in desig the tricycle landing gear, whic duces a weak hatch on the unde of the nose. At the same time extends further forward bey wing than in previous designs presents the possibility of th nose breaking off. This complic problem of placing passengers regions of the aircraft.

In some bombers the shape of is dictated to a large extent by t ence of a nose turret and bom window. In transport aircr shape of the nose can be fa shaped hydrodynamically witho aerodynamically unsound. It m be possible to approach the fly hull strength of about 2,000 po square foot. Even boat hulls strength would collapse if th were unfavorable. In the la shape appears more easily ob than the required strength. A approach toward flying boat sh strength improves ditching ch istics. Other factors which affe ing characteristics, such as wi and strength, etc., have alrea mentioned in previous chapters. tail wheel bomber, the bomb d the chief ditching danger, and tricycle transport the nose whe are a most unfavorable factor.

An indication of the degree of in ditching which can be achi favorable design is provided l ational ditching experience of t This aircraft has many qualitie account for its being the best di any present transport aircraft. a low, fairly thick wing; it has wheel hatch; there are no bom it does not possess undersurfa chute escape hatches; and it ha which is favorably shaped hydr

The C–47 has proved itself an lingly popular aircraft in civil and ry transport, thus indicating that litching qualities are not incom- with other operational require- ments. It is important to mention, however, that provision of passenger equipment to withstand deceleration and efficient raft stowages are absent (below). In view of the above, it can be appreciated that the nose wheel doors must be made at least as strong as the surrounding structure. This will provide a reasonably sound undersurface in the vital nose region.

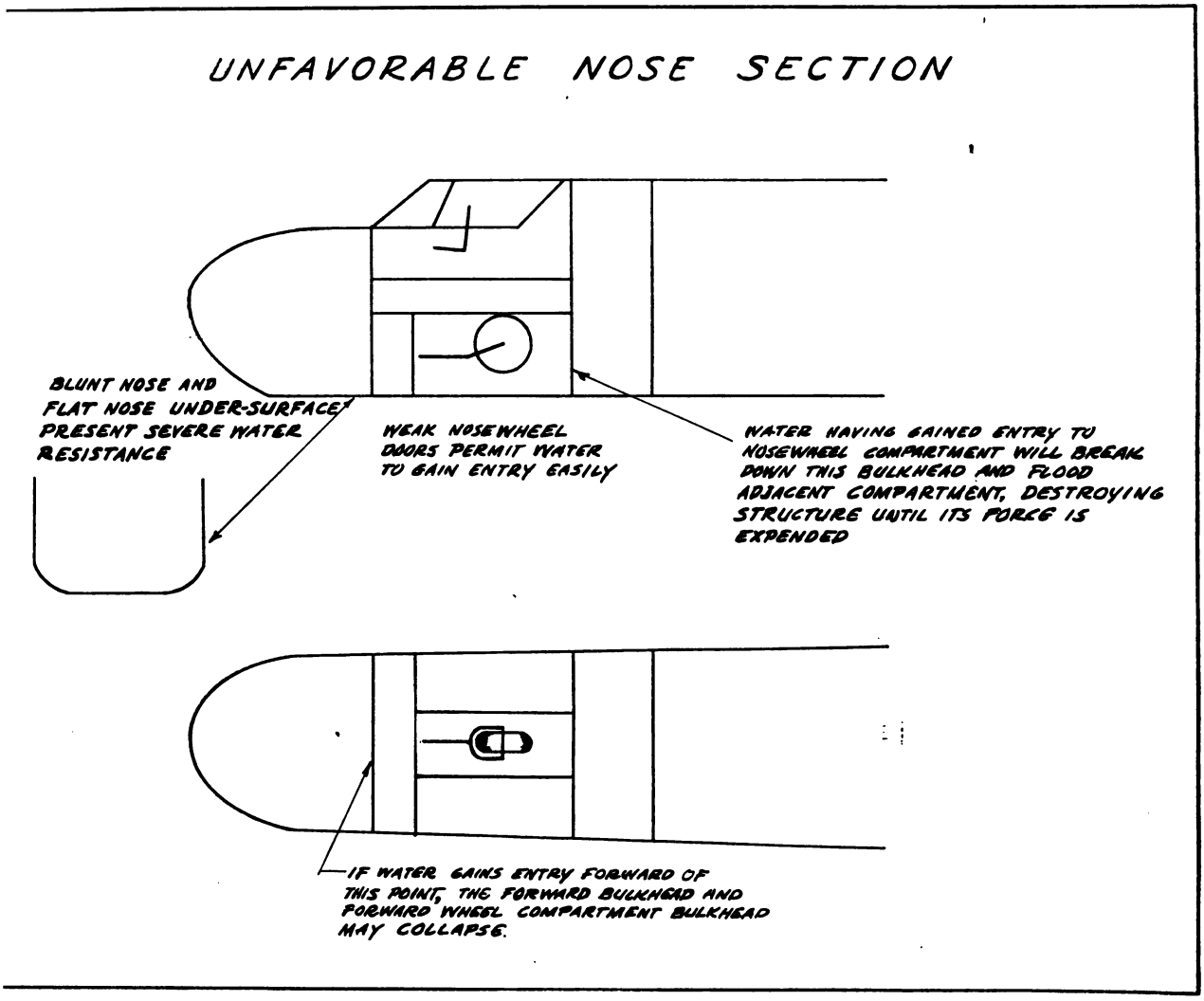


ILLUSTRATION 1

ter pressures in the region of the are not only due to the aircraft's rd speed but are greatly increased e aircraft pitches forward and the nose. The force of pitching may completely sever the nose the remainder of the fuselage, but water gains entry its great velocill initiate local breakup, which, ned with the pitching pressure, in- s the likelihood of complete frac- It is also important to realize ny individual who happens to be path of such a mass of moving and debris is likely not to survive. ere the skin bends but does not break, the loads are to some extent absorbed. However, where some strong structure suddenly terminates or where a strong bulkhead meets the skin, an acute local bending occurs, followed by fracture. Insofar as possible, strength should remain as consistent as possible throughout the length of the airframe. This factor, though elementary, has not been approached to the fullest degree in aircraft construction.

Illustration 2 shows the suggested improved nose design. Because of the oval shape of the nose, the upward forces are absorbed somewhat and transferred to side loads, and the build up of water pressure is more gradual. The incorporation of Catalina-type nose wheel doors insures that they will not collapse at least until the remainder of the structure fails. Should failure occur, the wheel compartment aft bulkhead is faired off down to a strong athwartship member at the base of the fuselage, thus deflecting the water outward and probably increasing hydrodynamic lift and reducing resistance. It might be advantageous to carry the side walls of the wheel compartment outward to the outer edge of the fuselage, but consideration of the weight factor may make this undesirable.

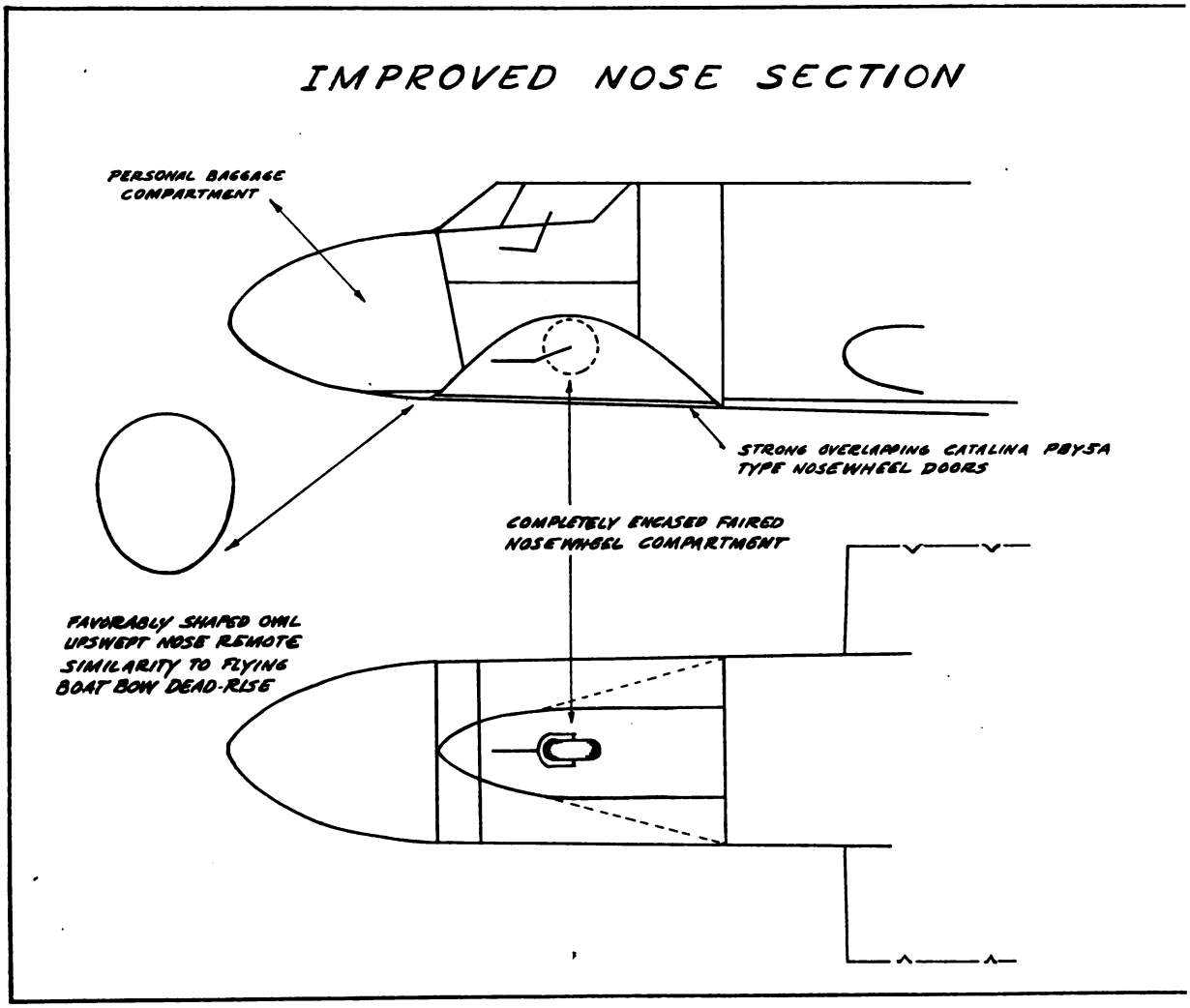


ILLUSTRATION 2

Personal baggage should be stowed in the nose compartment to provide buoyancy and to absorb water inrush resulting from nose fracture. Baggage, as opposed to heavy mail or equipment, is already normally situated in this position.

A low wing or low midwing is one of the prerequisites of a good ditching plane. The whole fuselage should be moderately curved fore and aft, culminating in an upward sweep near the nose. Fuselages should not be sharply curved as in the Hudson because no resistance to pitching is provided. Fuselages which are well streamlined like the B–17 and have relatively long noses and the center of gravity relatively close to the bottom, are extremely resistant to diving. The B–17 is a good ditching bomber; the C–47 has ditching characteristics similar to the Flying Fortress. In order to prevent rapid deceleration, it is important for the nose to bury at as low a speed as possible.

It is indicated from operational and model test experience that breakage of the fuselage aft of the wing trailing edge has the advantage of holding the tail down thus delaying burying of the nose. Nevertheless, subsequent tail-end failures may be serious. If the tail is held down too forcibly by the water, it will increase the waterborne angle of attack and cause the nose to drop from a considerable height. It is not sensible to permit breakage in an attempt to obtain advantageous characteristics. The obvious approach to the problem is in design of the structure aft of the CG to prevent bouncing off and yet not to hold the rear end down too forcibly.

The indications are that an oval fuselage terminating in a deep, narrow, moderately upswept tail-end is the most favorable shape. The narrowness permits the tail to run through the water without tending to bury the nose. The horizontal stabilizer should b as possible. If the whole rea be upswept, it delays the m which the tail will strike. point of primary impact appe a few feet aft of the wing trai It is fortunate that the optim of the rear end is a narrow o recommended nose shape is This permits over-all consis fuselage design, which is ne desirable aerodynamically n nomical for best utilization of accommodation.

INSTALLATIONS FOR PRO AGAINST HIGH DECELER

Any improvements for the of passengers against decelera ing ditching or crash landing prejudice first-class passenger modations and comfort of This is a commercial necessit

ıssenger aircraft it is advanta-
or seats to be used as ditching
. This reduces passenger move-
rior to ditching and assists in
ning a fairly calm state of mind
the passengers. Wherever seats
l as ditching stations they should
ıgthened to withstand the decel-
occurring on impact. Attach-
and the airframe structure to
they are secured must be sim-
trengthened.
estionably the best position for
ıssenger to assume during ditch-
o sit in the passenger seat facing
. In this position, only a lap belt
be required, and providing the
sufficiently strengthened, the pas-
assumes an attitude which in op-
al experience has proved to be
t. Ideally seats should be facing
nanently. If it is considered un-
ıble for passengers continually to
t during normal flight, the only
tive is to provide reversible seats.
an be done without detracting
he comfort or adding unduly to
The back of the seat should be
l on a pivot at its base and the
f the seat would serve as chan-
which lugs, secured to the back,
run. In this way the seat could
ɔly reversed and adjusted for the
ıg attitude. Whatever measure
ted, it must be such that the pas-
s state of mind is not unduly dis-
in preparation for an emergency.
most transports are good ditch-
nes, such steps may not be nec-

esent aircraft the use of shoulder
ɜes and ditching belts for passen-
old serve a useful purpose pend-
e introduction of ideal crash-
g seats. It is worth while to
n that if transport passenger
had been previously installed
ıently facing aft and suitably
hened, casualties in crashes on
ınd and water would definitely
ɜen decreased.
ther internal installations should
ıred so that they will not break
ɑd cause injury on impact. Suit-
ɜans for rapidly jettisoning cargo
ential.
s should be equipped with
ɜr harnesses attached to suitably
hened seats (or the airframe),
ɜ cockpit should be designed with
protrusions as possible to avoid
injury on impact. The remain-

COMMITTEE STUDIES PAINT DESIGN FOR RESCUE FACILITIES

Adoption of a standard paint design for rescue aircraft and boats has been undertaken by the Air Sea Rescue Agency Committee to Study Adequate Air Sea Rescue Facilities. The paint design for rescue aircraft has recently been agreed upon by the committee and now is being forwarded to the several services for further action. No conclusion has been reached as yet on the boat design. Tests for visibility of the proposed aircraft markings have been conducted by the committee and personnel of the Coast Guard Air Station at Elizabeth City, N. C.

The proposed markings are for use on rescue aircraft and boats operating within the continental limits of the United States and rear areas of the combat zones. There has been a need for easy recognition of a rescue plane at a distance and from the air and water and for exact identification for on-scene operations. Immediate identification will greatly help plane-to-boat and boat-to-plane operations when carrying out a rescue mission.

---

der of the crew should find suitable ditching and crash landing stations against bulkheads, paying particular attention to the location of cargo which may break loose.

PROVISION OF ADEQUATE EXITS FOR PASSENGERS AND CREW

In present aircraft the normal side entrance serves as one ditching exit for the passengers and crew while the pilot's upper escape hatch provides egress for the pilots. The emergency side hatches are usually somewhat lower than appears advisable since the exit should be opened before ditching. In C–47 and C–54 transports the rafts are launched from the rear door which is also the passenger exit. Usually passengers will require assistance to board the rafts, so delay is inevitable. For a brief period the crew will be occupied launching the rafts and emergency gear and, therefore, they will not be able to assist passengers immediately following the crash. Furthermore, should the aircraft float even slightly tail up the passengers will have difficulty disembarking, and in some cases may have to slide down ropes to reach the rafts.

Ditching safety in transport aircraft necessarily involves consideration of the less physically capable passengers—the aged, bulky men and women, and individuals otherwise handicapped. Even physically fit personnel find it hard to stand up when unused to movement afloat. Some passengers may not be able to slide down ropes. In planning exits, these factors should be considered because in spite of ideally situated exits the crew will have their hands more than full launching rafts and assisting passengers.

In low wing aircraft, the wing provides a good launching platform. Exits should be so arranged that the majority of passengers can emerge from the fuselage onto the wing. Fuselage exits should not be too high because those of low physique will be incapable of emerging. In view of the fact that there is a limit to the number of hatches which can be provided to maintain structural strength, the side door, if not too far aft, must be accepted as one ditching exit.

PROVISION OF LIFE RAFT EQUIPMENT

The location of life rafts and emergency equipment aboard the plane is of paramount importance. Experience has proved that crews are seldom able to transfer all the required gear from the fuselage to the raft. This prejudices their chances of subsequent rescue. As a governing principle in military aircraft, crews should have no other duties when abandoning the plane than looking after themselves and their incapacitated crewmen. They should not need to transfer equipment from the plane to the raft. In transport aircraft this factor is more important because crews have the great responsibility of assisting men, women, and children who, unlike military crews have never had continual ditching drill practice.

The answer is simple. The aim must be to have the life rafts automatically ejected with all the equipment fastened to the floor of the raft. This aim has been achieved to some extent by both the British and the Americans.

Life-raft stowages may be located in the inboard wing trailing edge, or farther forward if desired, and in the fuse-

(Continued on page 18)

COAST GUARD METHODS

of

Dropping Airborne Equipment to Survivors

FOREWORD

1. This article is intended to:

(*a*) Give PROCEDURE used by Coast Guard Air Sea Rescue Units after sighting survivors.

(*b*) List EQUIPMENT in use at present by Coast Guard Air Sea Rescue Units.

(*c*) Give specific METHODS used by Coast Guard Air Sea Rescue Units in dropping the various items of equipment. The methods described check closely with those recommended in t Service Bulletins and Technic

2. Since this article is con marily with the use of mostly of the droppable ty and communication procedu discussed in detail.

622348—44——2

PROCEDURE

searching for survivors, fly at
based upon following facts, if

f survivors without raft or dye fly below 500 feet.

f survivors in raft, but without rker or signaling equipment, fly o 1,000 feet.

survivors have dye marker, fly to 2,500 feet.

f survivors have signaling equipnd/or radar reflector, fly at 1,000 feet.

gures are based on the best sightances for the various situations ied. If none of the above infor- is known, 500-foot altitude is red best for searching. In any arch altitude also must be limited to range of effective visibility.

2. When searching have all observation positions manned and when survivors are reported by any lookout, immediately drop drift signal, note plane heading, and apply relative bearing of survivors to obtain true bearing of survivors from these position markers, for use in relocating survivors. Dye marker should not be dropped at this time as it may be some distance from actual position of survivors and thereby result in misleading other searching aircraft.

3. Once survivors are seen by pilot, fly directly toward survivors, keeping survivors always in sight. Switch on emergency IFF equipment.

4. On first pass above survivors mark exact position by dropping drift signal and dye marker directly alongside or slightly downwind of survivors. (If survivors are in raft, they will drift toward these markers.)

5. If survivors are without a life raft, make second pass and drop life raft directly upwind of survivors. (Life raft then will drift to survivors.)

6. Remain on scene to orbit as long as possible, while communications are carried out, position reported, and rescue effected. Before leaving, for whatever reason, switch off emergency IFF equipment.

7. If near nightfall or if forced to leave scene without being relieved, drop Aircraft Signaling Kit plus electric Floating Lantern and/or Carbide Water Light; also, "Gibson Girl," if available.

8. If survivors cannot be saved promptly, drop Aircraft Ration Kit or more complete Shipwreck Kit.

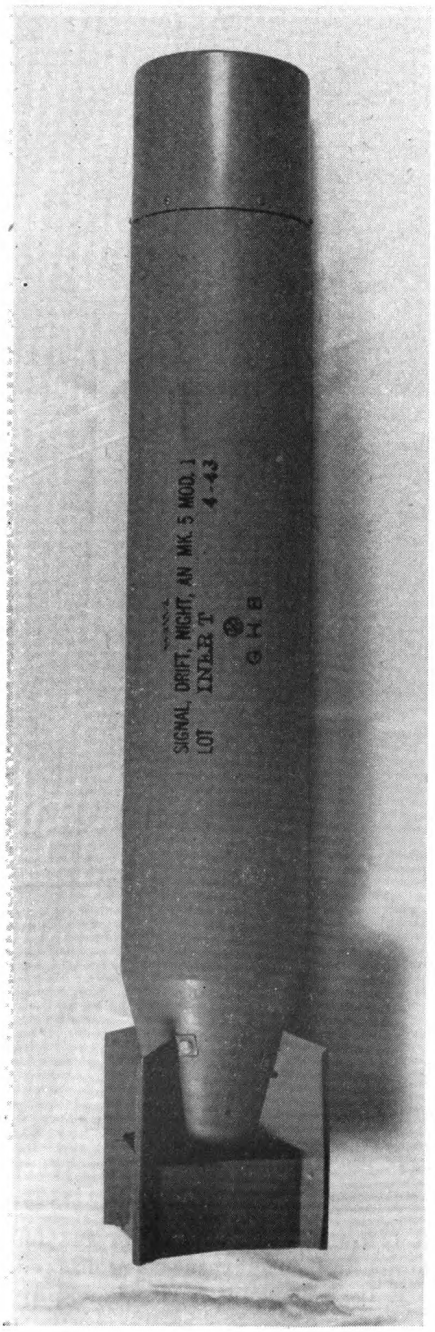
9. If apparent that rescue will be delayed, drop Lindholme Gear or equivalent.

EQUIPMENT

ignal, Drift, Mark 4. BuOrd item. umber of units: 1 each. Weight: 2 pounds.
Contents: Powder which burns to emit smoke and flame.
Purpose: Position marker of 3 to 4 minutes duration.

(*b*) Signal, Drift, Mark 5. BuOrd item. Number of units: 1 each. Weight: 2 pounds.
Contents: Powder which burns to emit smoke and flame.
Purpose: Position marker of 15 minutes duration. (See pictures col. 1, page 11.)

2. Marker, Dye, Sea. BuAer #R37–P25 or R83–M–106500.
   Number of units: 1 packet, one can. Weight: 1 pound (or 1 can).
   Contents: Fluorescein dye marker.
   Purpose: To provide colored slick to mark position in the water for a period of at least one-half hour.
3. Light, Carbide, Life Ring. BuOrd Night Marker Mark 1.
   Number of units: 1 can. Weight: 6 pounds.
   Contents: Calcium carbide for burning in contact with water.
   Purpose: To burn with a bright flame to mark position for approximately 5 hours; visible 15 miles.

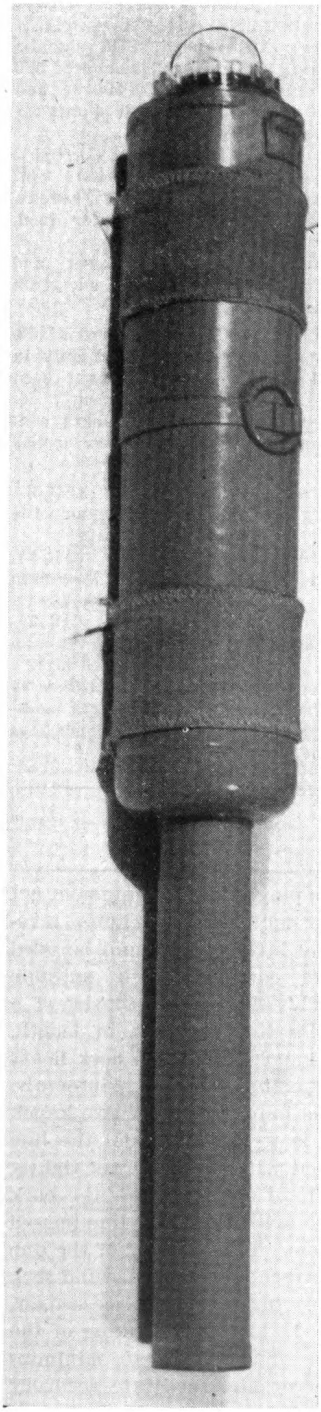


4. Lantern, Floating. BuAer #17–I–7495.
   Number of units: 1 each. Weight: 3 pounds.
   Contents: Bulb and batteries for providing electric light.
   Purpose: To mark position for 22 hours or longer; visible 3 miles. →
5. (*a*) Raft, Pneumatic Droppable, Mark 2. BuAer #R83–R–15510.
   Number of units: 1 case. Weight: 55 pounds.
   Contents: Raft, survival supplies, food and water.
   Purpose: To provide vessel for two survivors in water.
   (*b*) Raft, Pneumatic Droppable, Mark 4. BuAer #R83–R–15530.
   Number of units: 1 case. Weight: 82 pounds.
   Contents: Raft, survival supplies, food and water.
   Purpose: To provide vessel for four survivors in water.
   (*c*) Raft, Pneumatic Droppable, Mark 7. BuAer #R83–R–15570.
   Number of units: 1 case. Weight: 112 pounds.
   Contents: Raft, survival supplies, food and water.
   Purpose: To provide vessel for seven survivors in water.

See pictures pneumatic droppable life rafts Mark 2 and Mark 4 on page 12.
See picture pneumatic droppable raft Mark 7 on page 13.

6. Kit, Signaling (ADS–1). BuAer #R83–K–709970.
   Number of units: 1 case. Weight: 10 pounds.
   Contents: Flashlight, flares, smoke hand signal, mirror, dye marker.
   Purpose: To provide survivors with means of signaling.

7. Aircraft Droppable Ration K BuAer #R83–K–709980.
   Number of units: 1 case. pounds.
   Contents: Solar drinking canned water, Permuti
   Purpose: To provide ra and additional drinking ply for survivors.
8. Aircraft Shipwreck Kit (M5 BuAer #R83–K–710400.



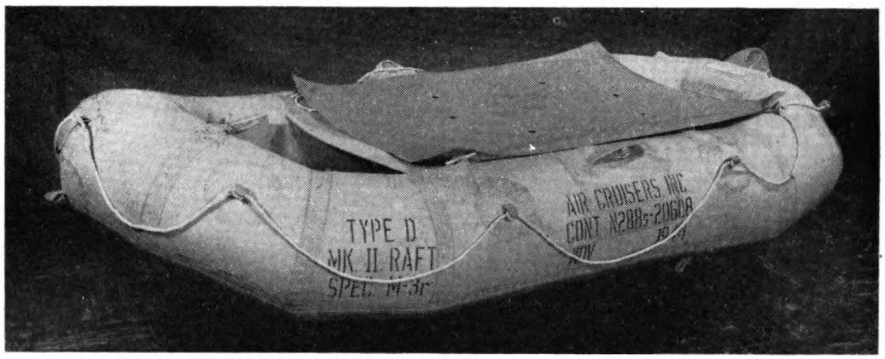
FLOATING LANTERN

umber of units: 1 case. Weight: 70 pounds.
ontents: Survival equipment, food, and water.
urpose: To provide essential equipment for survivors.
Transmitter Assembly (SCR–578–b).
er #R16–D–9169.
ibson Girl." Weight: 40 pounds.
umber of units: 1 case with parachute.
ontents: Radio transmitter, kite, balloons, antenna and accessories; signaling light.
urpose: To transmit SOS signals, homing signal (earlier models 500 kc. only; later models, 500 kc. and 8280 kc.). To furnish light for visual signals.
holme Rescue Dinghy Gear (British).
umber of units: 5 cases with connecting lines. Weight: 212 pounds.
ontents: 15-man life raft, food, clothing, and medicine.
urpose: To provide vessel and abundant supplies for survivors when rescue is delayed.
—Lindholme Gear has been available Jnited States Coast Guard only in ited quantities, and has not been the other Services. Recently denited States Navy equivalents, conof multiple unit assemblies, are as

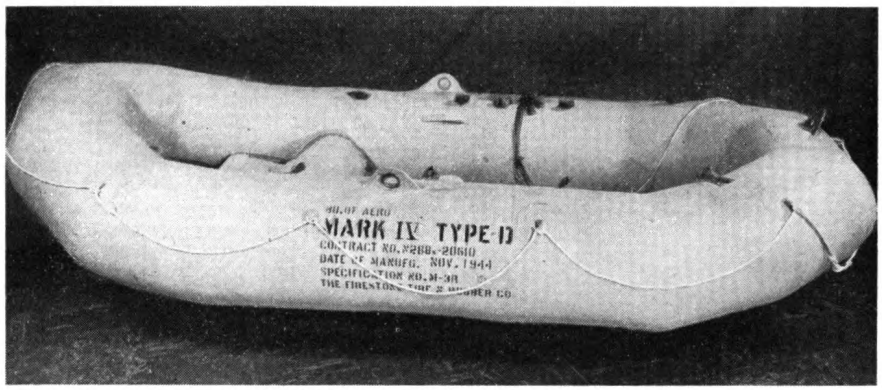
irborne Rescue Assembly (AR–2). Weight: 195 pounds. Two-man life raft and two shipwreck kits.
irborne Rescue Assembly (AR–4). Weight: 222 pounds. Four-man life raft and two shipwreck kits.
irborne Rescue Assembly (AR–7). Weight: 392 pounds. Seven-man life raft and four shipwreck kits.
se consist of regular stock life rafts ipwreck kits with containers modir dropping from airplane bomb bays stened together by lines.

METHODS

dropping survivor equipment not nor equipped with chutes, a re- line invariably should be used craft equipped with suitable . This line should consist of a nanila line 150 feet in length, by kapok sections of cork floats proximately 10-foot intervals. m is improvised. Where kapok , it is wrapped around the line tened with strip canvas tightly Where cork is used, the cork s are drilled and the line passed them. The trail end of the line be attached to a small wind sock BuOrd target release messenger, Mod. 1) to reduce kinking of the This line is used to minimize g error and facilitate recovery ivor, since any survivor who can



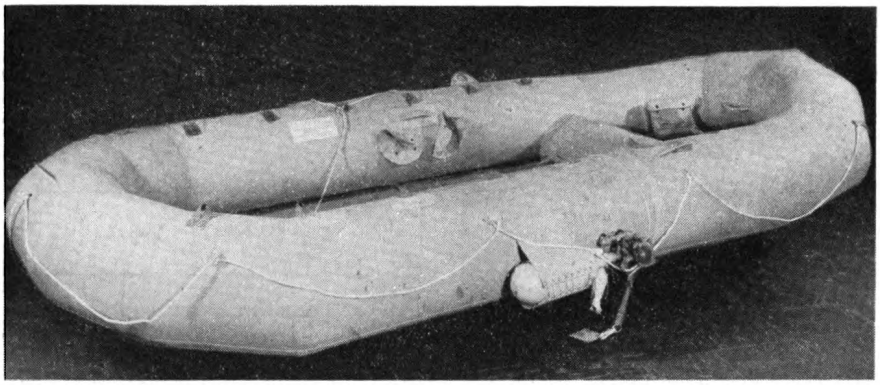
USN PNEUMATIC DROPPABLE RA FT MARK 2



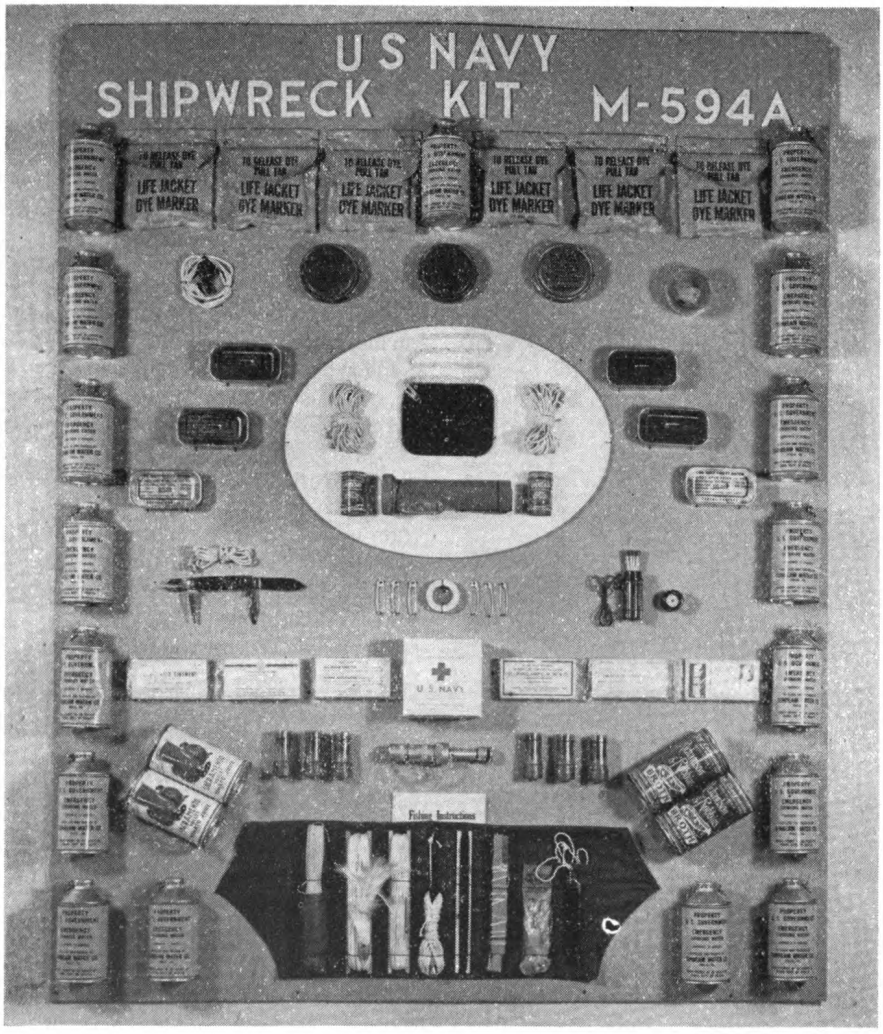
USN PNEUMATIC DROPPABLE RAFT MARK 4

reach the line can pull equipment to him. The line is carried coiled up in the airplane before use. During drop, it is trailed out, attached to and followed by the equipment being dropped.

2. In dropping drift signals and dye



USN PNEUMATIC DROPPABLE RAFT MARK 7



marker from cockpit type airplane, drop overboard by hand. In dropping drift signals and dye marker from cabin-type airplanes, it is recommended that these items be dropped from flare chute by use of flare release. (In some aircraft it will be necessary to relieve spring tension on the release mechanism.) Drift signals, Mark 4 and 5, should be dropped from an altitude of not less than 100 feet to assure operation. To facilitate functioning from this low altitude, the paraffin disk in the nose must be cut away prior to loading. (Drift signal, Mark 6, now being developed, will have a pull-type igniter and will function from any altitude.) Dye marker dropped in this manner should be carried in small paper b will break on striking the w minum powder can be mixe marker to improve sighting istics.

3. In dropping carbide lig the seal and drop overboard low altitude.

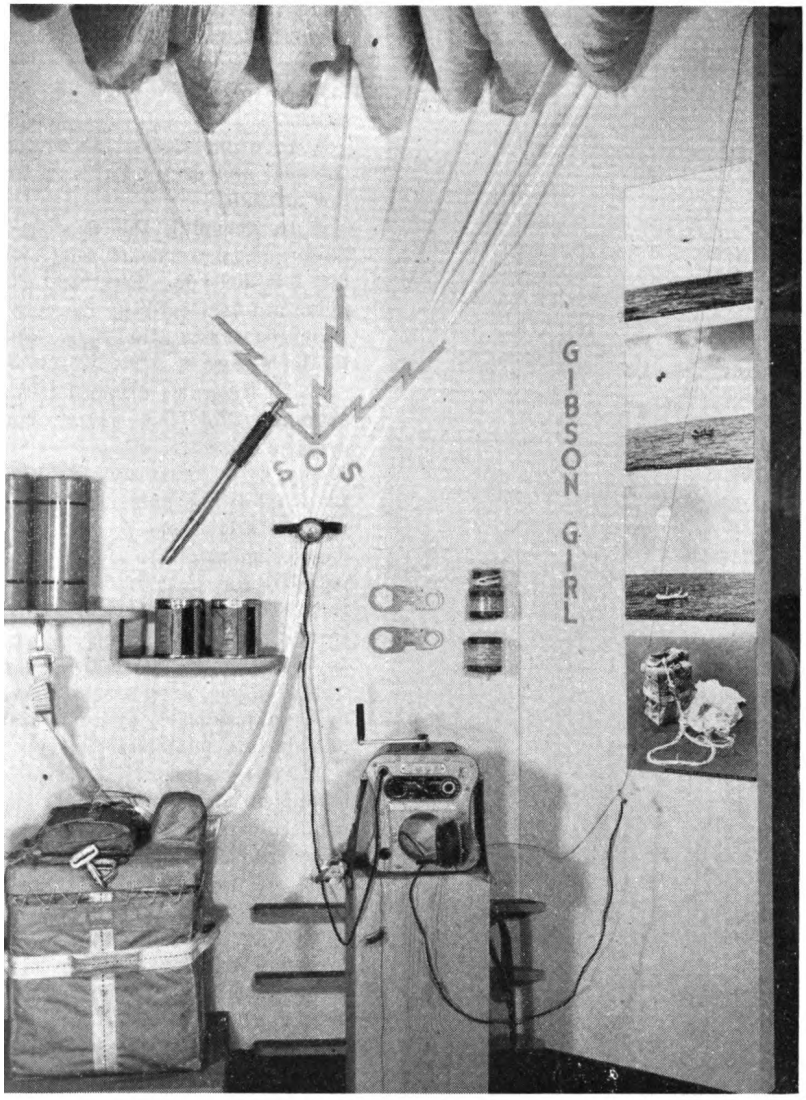
4. In dropping the floati lantern, drop overboard, lens any low altitude. Electrical made automatically by merc which functions when light r in the water.

5. All life rafts dropped t swimming in the water dropped directly upwind o vivors by aircraft flying di the wind at approximately 10 tude, to allow time for infla enables survivors to obtain l permitting it to drift down u that is, the life raft will dr rather than away from the In dropping life rafts from type airplane, drop a self-inf by hand, preferably by use of or from the bomb bay.

6. After survivors are in lif equipment dropped to them dropped directly alongside or of them by aircraft flying int with the use of retrieving li possible. This will enable th to drift or row downwind r into the wind to recover This procedure applies parti signaling kit, ration kit, and kit, which are dropped ove hand from any low altitude.

7. In dropping the "Gibso into the wind at 300 to 50 tude at minimum speed and position directly over surviv equipment is dropped from a airplane and descends by pa leased by static line; forw will be equalized approxi downwind drift during descen

8. In dropping Lindholm Dinghy Gear or Airborne Res blies (see picture on page 16) wind at approximately 100 fe at minimum speed, and drop from bomb bay by use of inte in a long spread slightly do survivors. The containers of holme Gear are fastened b yards long (maximum sp yards). Lindholme Gear is to function automatically up sion in water; the life raft i sea drogues are released fro

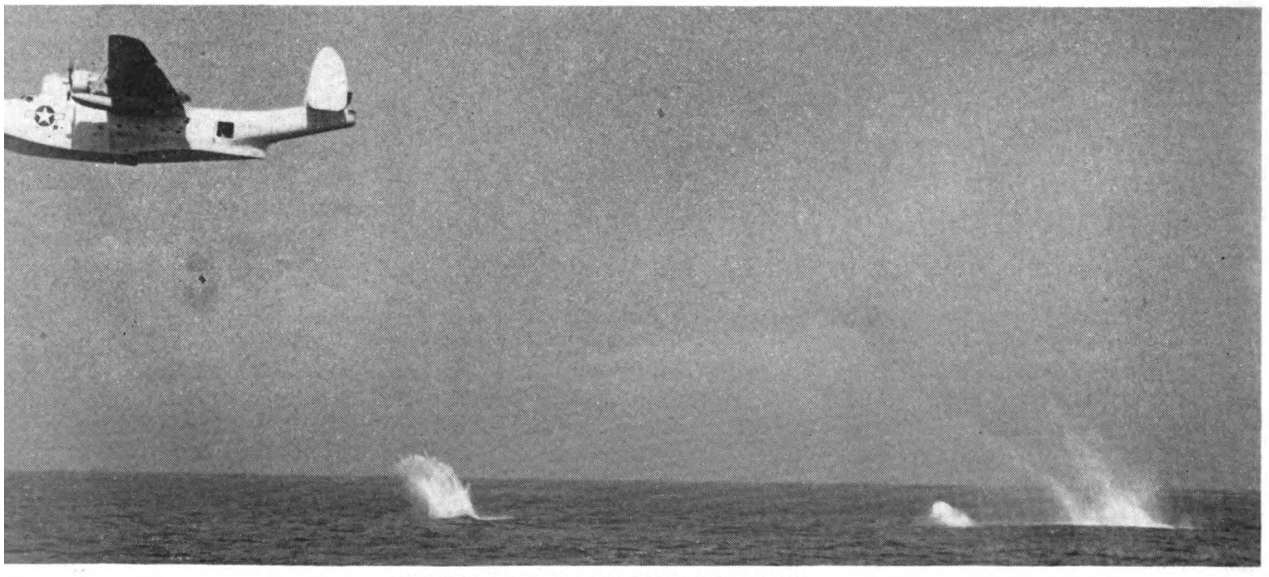


tainers. The containers of the Airborne Rescue Assembly are fastened by lines 35 yards long (maximum speed, 70 yards for AR–2 and AR–4; 140 yards for AR–7). These assemblies must be opened manually.

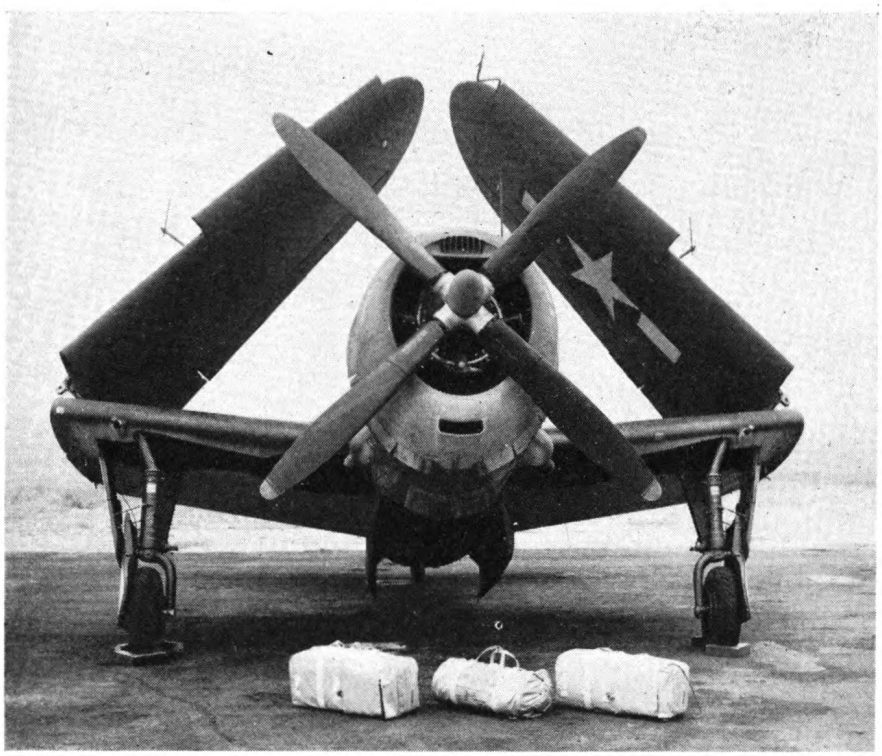
NOTES

(A) In making drops, always fly into the wind, except in case of Lindholme Gear and Airborne Rescue Assemblies fly crosswind. Position for point of drop will depend directly upon speed and altitude. Greater accuracy in dropping equipment will result from use of constant speeds and altitudes in all dropping operations. All equipment should be dropped at minimum speed and from lowest permissible altitude to assure its landing close aboard survivors and to minimize possibility of destruction upon impact.

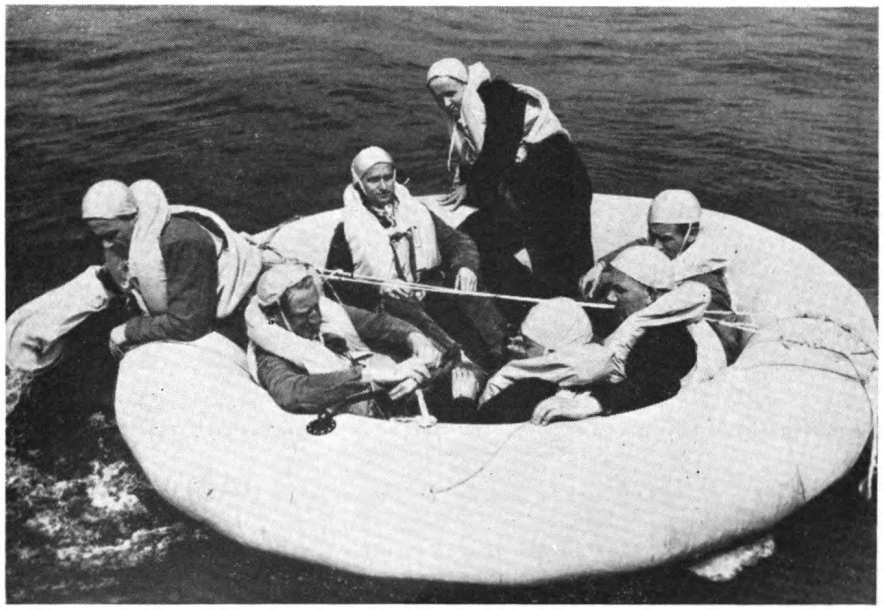
(B) Accurate dropping of equipment from aircraft depends on practice. The differences in weight and bulk of the various droppable equipments give varying characteristics to their trajectories. Trial drops with the different types of equipment will aid in the development of "seaman's eye." Always aim at survivors with the intention of landing equipment directly alongside. Where error occurs, "shorts" (where equipment falls downwind) are preferable to "overs" (where equipment falls upwind), except in case of life rafts, which must always be dropped upwind. Small



DROPPING MULTIPLE UNIT ASSEMBLY



USN AIRBORNE RESCUE ASSEMBLY (AR-2)



BRITISH LINDHOLME RESCUE DINGHY
(One part of multiple unit assembly)

errors in range generally will be compensated for by the retrieving line.

(C) In dropping equipment from crew-manned aircraft, coordination between conning pilot and crewmen must be effected to attain proper timing of drops. Pilot should use interphone system to keep crew informed in advance of what equipment will be dropped and when. After designating a particular item of equipment, pilot shou necessary commands in seq typical illustration follows:

PILOT: Prepare to drop 4-m
(5 minutes before dropping
CREWMAN: Ready to drop raft.

CORNER REFLEC ASSIST IN SEAR FOR RUBBER R/

Recently a new device has oped which will enable rada search planes to locate lif greater distances than here sible. This device, known as reflector, increases the rang detection because it has th of reflecting back to the sou portion of the radar energ upon it.

The actual operation consi ing more than erecting the the raft. There are no tub teries, and no cables—just weight umbrella-like contra posed of three reflecting plan metal mesh that intersect ea right angles. The loose meta chosen because of its corrosio properties (will withstand th salt water for from 30 to 60 because the loose mesh reduc and weight.

Two models are being pr MX–137/A and the MX–138/ gle and multiplace rafts re The two are very similar but it proved necessary to pa differently because of the sto lem in the different rafts. reflector is designed to fit i shaft of the multi-place raft; man raft a collapsible mast as part of reflector.

It is suggested that all fly nel make it their business where the reflectors are to b rafts and raft packs—and h them. Certainly a device w rafts "visible" at substantia regardless of actual visibility is welcome news and makes e equipped plane a potential craft.

It is anticipated that the flector for the multiplace MX–138/A, will be availabl 1945; and the one-man raft, about the same time.

Pay out retrieving line (2 to 3
tes before dropping).
MAN: Line out and clear.
Stand by (when starting run).
MAN: Stand by.
Drop (when in position).
MAN: Raft dropped and clear.

When airplane is equipped with
l hatch, as in patrol seaplanes,
nt generally can be dropped best
is hatch. This is particularly
ere retrieving lines are being
. (See other pictures accom-
this article on this page and on
.)

IOLOGICAL ASPECTS OF RVIVAL AND RESCUE

(Continued from page 4)

is water and dry the clothing 32
quired, i. e., the rate of heat
ion would have to be doubled for
s or tripled for 16 hours. Condi-
e much improved if water evap-
is hindered or prevented by use
rproof apron in dinghy (as in
type K) or by exposure suit. If
e suit is worn before immersion
clothing remains dry when in
t 32° F.: Heat production needed
tain thermal balance less than
Probable time interval to un-
isness indefinite—days. Prob-
e interval to fatal hypothermia
e—days.

TIONAL CONSIDERATIONS

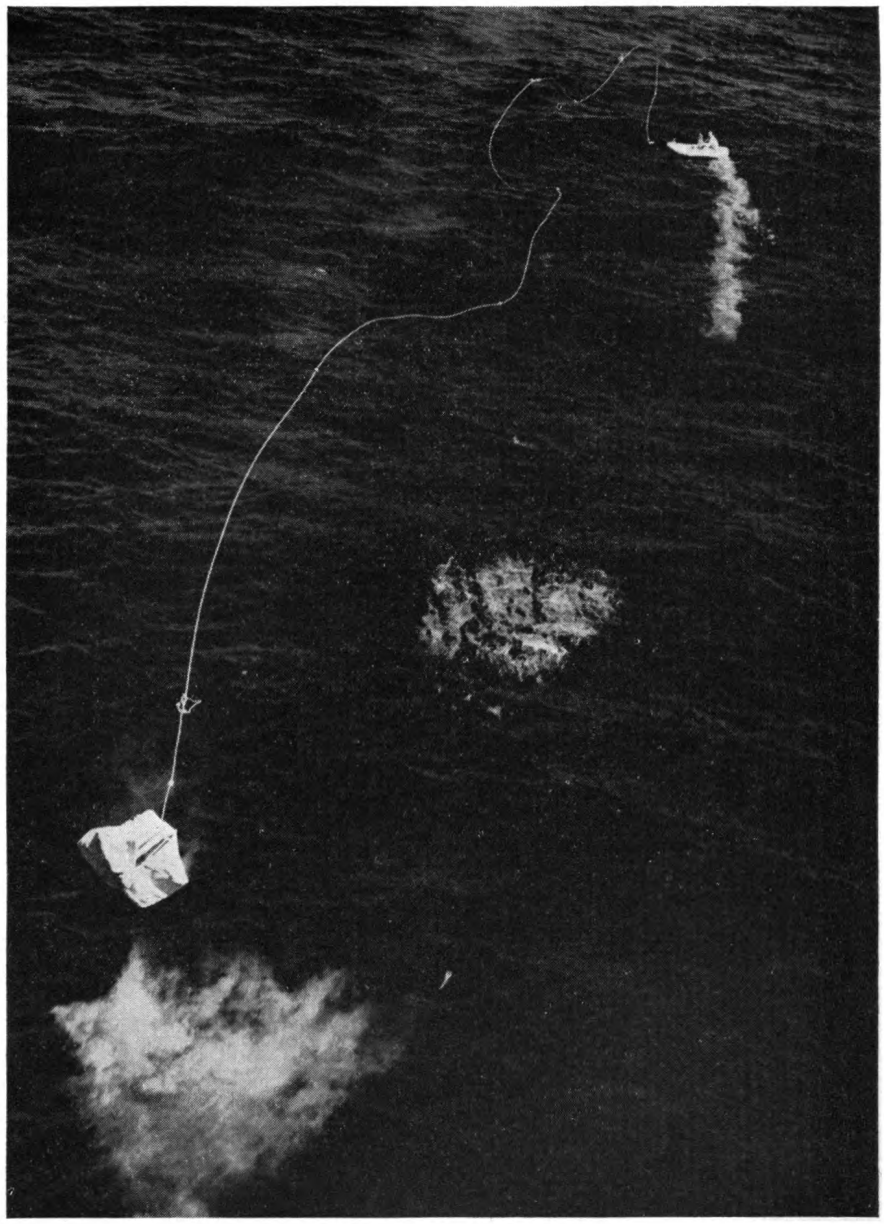
rming must be slow after severe
e. Life jackets should provide
pport to take care of uncon-
ut living survivors.

IRCRAFT EXPOSURE SUITS

ure suits for aircraft are still
evelopment in the United States.
ssible that one type of suit will
red by fighter pilots and another
er crews.

HT TROPIC TEMPERATURES

xposure to night cold as a threat
ival in the tropics is not very
the castaway has retained his
which was worn when his plane
ed down. Presumably, this will
of underwear and a light flying
he air and water temperatures
Southwest Pacific rarely fall be-
F. Experience shows that an



DROPPABLE LIFE RAFT DELIVERY

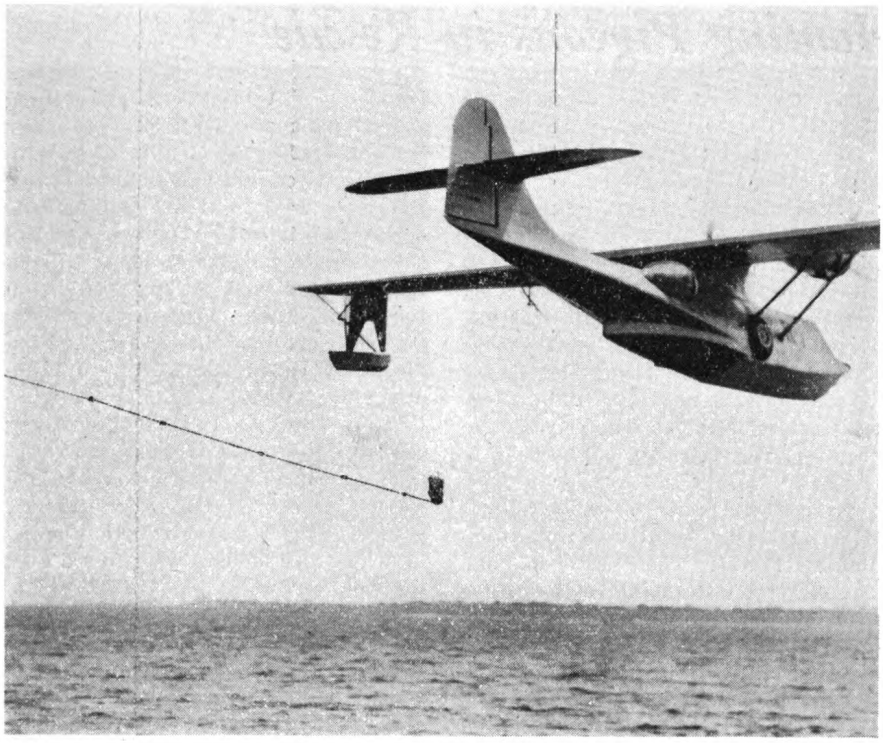
By rescue plane as described on page 13. The raft is inflating during descent. Note retrieving line and smoke from drift signal.

individual whose clothing is wet is definitely chilly at temperatures in the range of 80°. If his clothing is fairly dry or if he has protection such as a poncho or tarpaulin, he remains fairly comfortable.

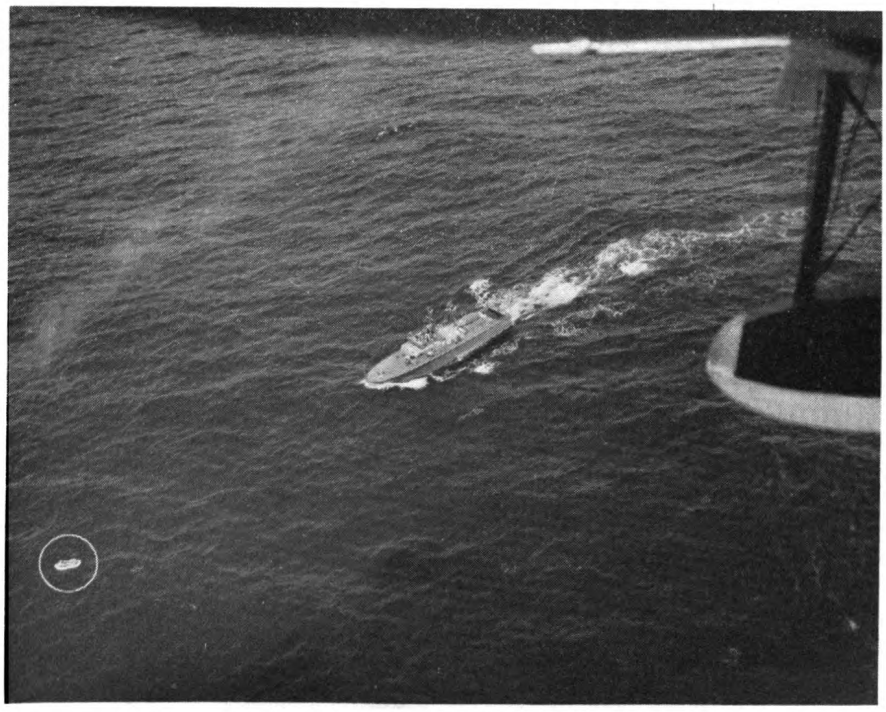
(d) IMMERSION FOOT

It is believed that cold is the principal factor in the causation of immersion foot and that wetness is a factor only insofar as this causes cooling. These beliefs are strongly supported by the evidence given by these authors. It is also likely that prolonged maintenance of the sitting posture is a contributory factor, since this is capable of producing injury even in the absence of wetness and extreme cold.

Preventive measures aim at removing these primary causes. Feet should be kept as warm as possible since injury occurs more rapidly and is more severe the colder the feet. Even a small amount of local insulation is of value



DROPPABLE SHIPWRECK KIT
Descending from tunnel hatch of rescue plane



RESCUE BOAT
Approaching survivors in life raft (circled) to effect rescue as a rescue plane circles overhead. Note smoke from drift signal.

PHYSIOLOGICAL ASP
SURVIVAL AND RE

(*Continued from page*

though the conditions are su
body is cold. For example,
thickness of cellular rubber
lular sponge rubber) is suffic
tect feet immersed in water
for at least 30 hours under t
tions. However, ordinary
loses its insulative value w
comes wet. Possibly footgea
protected by waterproof env
these might be punctured
water might otherwise gai
Insulation that is unaffected
e. g., cellular rubber, seems
sirable. Local heating is an
ure that might be considered
this could be harmful to feet
jured. Keeping the feet ou
would be of benefit if the fe
thereby exposed to a strong

Maintaining body warmth
greatly in keeping the feet
quantity of insulation which
feet immersed in ice wate
54° F. when subjects are nea
ering point is sufficient to ke
at a considerably higher t
when the subjects are c
warm. Exposure suits, in
heavy clothing, would be ne
keep the body warm in the e
in which immersion foot occ
cise and food would be of
tary value.

Local exercise of feet has
mended as a prophylactic m
repeated strong flexion and e
the toes does increase the t
of feet immersed in ice water
also aids in the removal of e
However, abrasion and bliste
might result from friction;
foot exercise should be ben

Measures to avoid interfe
circulation should be taken
against large blood vessels
ing or other sources is to
Shoes should be removed wh
come tight. Feet should b
if they are not consequently
colder conditions. While t
ures are believed to be se
those designed to keep the
they may minimize the seve
damage caused by cold.

No local or general med
been proved to be of value in

(*Continued on page 1*

Use of Homing Pigeons in Rescue

ıg pigeons have been successful mitting messages in some emer- where they have been used, and lots who know of their value em among the equipment of their Bombers in combat have carried rs of these hardy birds to sup- maged or lost radio equipment the plane is forced down in erritory, or it is necessary to the ocean. In cases where radio nust be maintained, they have l auxiliary communication, si- efficient.

mporary warfare in some in- has succeeded in not only re- he use of this old and accepted of communication but also in ng its dependability. In World almost a million pigeons were l 90 percent of all messages sent means are reported delivered. resent war, they have been used tate the rescue of air personnel ve been forced down either on sea, in addition to carrying tac- ssages.

irst account on record where aided in the rescue of the per- f a downed plane occurred in en several search planes were sent to look for a plane lost near the Mexican border. Because of engine trouble, one of the search planes was forced to land in mountainous territory near Douglas, Ariz., far from habitation. By good fortune a basket of pigeons was included in the plane's equipment, and these were promptly dispatched carrying messages of the approximate location, supplies, and plane parts needed to make the plane flyable. In 3 hours the pigeons arrived with the messages, and a plane was sent to drop the equipment. The crew repaired their ship and returned to Douglas.

Pigeons have been used successfully as a rescue aid by the British and Canadian Air Forces. Their use is optional. The story of a dramatic rescue of five R. A. F. men forced down 63 miles out in the North Sea after a battle with a Messerschmitt will illustrate the reason for the popularity of feathered messenger service. The plane had plunged before the wireless operator could send through an SOS. The plane remained afloat only 90 seconds—time to get the raft inflated and climb aboard. Fortunately the signalman remembered the tin container of pigeons which was their one hope of speedy communication with home base. A crudely scrawled message giving approximate location of the bobbing craft was quickly inserted in the message capsule and an instant later the bird was "tossed." Quickly she spiraled up into the sky, then streaked a beeline for the British Isles. Ninety minutes later the bell rang at a loft on the northeastern English coast—the pigeoneer obtained the message and immediately called the SOS into headquarters. Two minutes later the wireless operator of an offshore destroyer received the same message and less than 12 hours after releasing the bird the five men saw the prow of a friendly warship loom out of the fog and stand by while rope ladders were tossed over the side.

The homing pigeon is a highly bred bird combining characteristics of intelligence, strength, reliability, and speed. It may be almost any color—red, blue, gray, white, checkered—but the homing instinct is characteristic of them all.

Training starts when the bird is no more than a few days old. The "settling" process, during which the bird learns to regard the loft as its home, requires patience and careful handling. When the bird is about 4 to 6 weeks old, it is released late in the evening before feeding. It returns to the nest promptly both for food and to avoid flying in the darkness. As its education progresses it is allowed more flying time until ready for the trial which is a test of its innate homing instinct. It is taken a distance from the loft and allowed to return.

(*Continued on page 22*)

YSIOLOGICAL ASPECTS OF SURVIVAL AND RESCUE

(*Continued from page 17*)

on foot. Petrolatum or other as been advocated for local use, alue remains in doubt.

IMMERSION FOOT CARE

er injuries should be prevented ng the footgear dry and the feet possible. If the feet swell, and s become tight, they should be and the feet wrapped in any cloth or rags. The feet should ıbbed and blisters should not be Pressure upon the feet should ed by supporting the legs above es in a horizontal position. On scued or on reaching land the with immersion foot should not his feet; he should crawl if he move himself. The survivor emain off his feet, if possible, l blisters, numbness and pain appeared.

LIFE RAFT FIRST AID KITS

One recently suggested and seemingly compact and useful life raft first-aid kit contains:

Bandage, gauze, compress, 4 by 4 inches	1
Bandage, gauze, roll, 3 inches by 6 yards	1
Bandage, triangle, 40 inches	1
Sulfadiazine tablets 0.5 gm	12
Morphine tartrate, syrettes, 32.0 mgm. (0.5 gr.)	2
Scopolamine hydrobromide, tablets 0.65 mgm	6

The contents listed above are considered the requirement for one man; multiples should be supplied in large rafts. The container for the kit should be reclosable in such a manner that even though it is immersed, the remaining contents remain dry. This kit has been accepted and will be available shortly.

LAND PLANE DITCHING

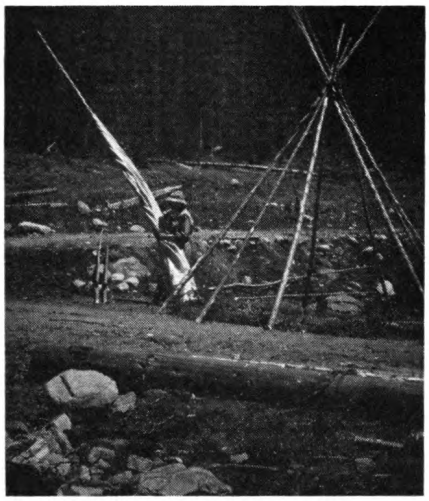
(*Continued from page 8*)

lage roof in the region of the center section in order to be available to passengers and crew embarking from the wing.

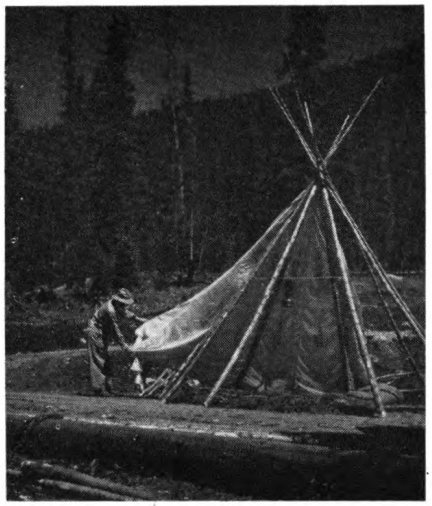
Great progress has been made in design of air sea rescue equipment during the war. The equipment below is listed where the emphasis is on rescue as opposed to survival:

1. Antideceleration provisions.
2. Adequate exits.
3. Rubber rafts and life vests.
4. Radio and radar aids.
5. Visual signals.
6. First-aid equipment.
7. Water.
8. Anti-exposure equipment.

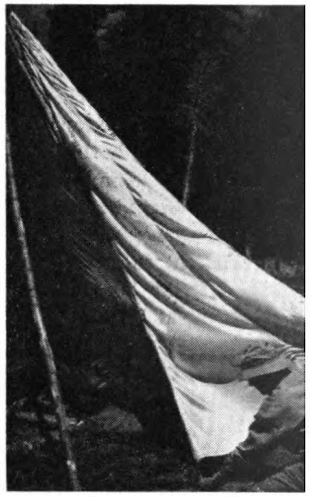
PARATEPEE—SHELTER FROM PARACHUTE



1. Placing the "Tie Pole" in Position.



2. Spreading the Parachute Fabric.



3. Pegging the Parachute to th

Aircrewmen, in addition to being good pilots and mechanics, must be trained to take care of themselves on the ground after crash landing or after bailing out in timber regions. Ability to provide adequate shelter and protection under adverse conditions, particularly when the airplane is no longer available, is a prerequisite of survival. The problem of improvising suitable shelter in forest country can be accomplished with a minimum of effort and equipment. Two things, timber and the parachute, are necessary to construct a paratepee, of which the Sioux Indian tepee is the prototype.

The paratepee, a combination of the parachute and the tepee shelter, has been designed for emergency landings in timber regions by the Arctic Training School and the Arctic Search and Rescue Division of Buckley Field. Subjected to vigorous service conditions during 6 months in the Colorado Rockies, the paratepee has withstood snow, hail, rain, and mountain winds.

The parachute shroud lines with a breaking strength of 500 pounds have been put to excellent use. The shrouds stretched between poles furnish ideal drying facilities for wet clothing. A shroud line stretched across the fire and equipped with pot hooks simplifies indoor cooking.

The original transportable tepee, constructed by the western Indians, was made of skins from the cow buffalo stretched over a cone of "lodgepole pine." Its weight demanded horsepower. The evolution to its present extraordinary use was due primarily to the migration of the Conquistadores' horses northward to the "Buffalo Country." This tepee was the only light, flexible shelter used in the Western Hemisphere in which a fire could be used with safety and efficiency.

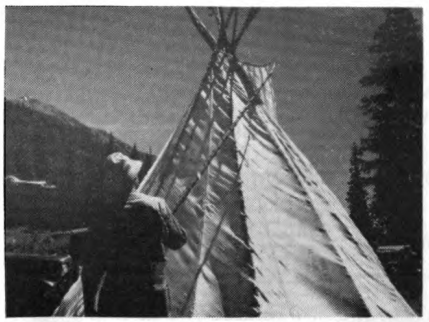
In the early tepee structure, the sewn hides wrapped around the frame were held in place by a single pole fastened to the top corner flap of the hide covering, but the wind blowing toward the flap was deflected into the tepee causing smoke and discomfort. Two smoke wings and an extra pole were designed as an efficient draft regulator.

With a few simple changes and the use of light parachute fabric in place of animal hides, the present paratepee has finally evolved into an efficient and useful shelter. Weighing only 5 pounds and 11 ounces, the 14-segmented parachute fabric has greatly enhanced the tepee's mobility and usefulness.

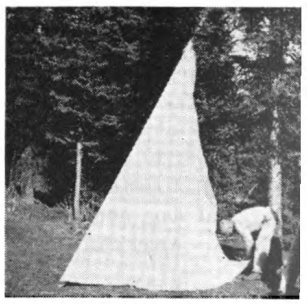
For a foundation the paratepee utilizes a tripod tied at the top, reinforced with 5 extra poles 12 to 14 feet long, slanting toward the ground to form a circle about 11 feet in di ninth pole called the "tie pol in position directly opposit space (picture 1). The par ric is stretched around the the pole circle (picture 2) tinued until the entire 14 se used. The tepee is pegged to by means of short bowline lo in length, fashioned from th shroud lines (picture 3).

The next step in erectin tepee consists of placing the poles at the apex into posi the shroud line loops sewe edges of the upper part of th fabric (picture 4). Regula smoke flaps is accomplishe ing the poles at the base. tepee is now complete with and 14 forming a folding do

In emergencies, where imm tection for the wounded r treme haste, or in regions is insufficient timber, a "o can be made in a few mi parachute can be erected three-pole or a standard (picture 5).



4. Adjusting the Smoke Flaps.



5. "One Pole" Paratep

:rman One-Man Raft Compared With Army and Navy Pararaft

:te with a compact first-aid kit, ılazone tablets for purifying ıd even a sharpening stone for , the kit should enable the aver- to survive for many weeks tural plant and animal foods tained. Emergency rations for :e included, but the main em- on living off the land or sea. al AAF Survival Manual is in- one of the vest pockets; there n instruction book explaining possible uses of all the mate- ined in the C–1 Vest Kit. Both were compiled by the Arctic, nd Tropic Branch, Army Air ıctical Center, Orlando, Fla.

ılation from a German Army discloses how closely the ıne-man inflatable dinghy par- 's in shape, color, and equip- t is interesting to note the es and dissimilarities. The ın gives a description of the instructions for its use and nce.

ıghy is packed in an outer con- ıich serves simultaneously as ıpron of the parachute. It is :o the person by two straps and ı place after the parachute has soned. It must be worn with ess types of life jackets and ıble to the seat or back type :. The dinghy is put on to- th the parachute pack. After the dinghy by the shoulder and the parachute straps are at- the usual manner. The seat : straps are fastened by flaps ; studs to the dinghy outer pack on the back parachute, the ıck is fastened by four press the back cloth of the chute back pad.

ıghy equipment consists of a r and bailer which are stowed te pockets in the bottom of the Additional emergency equip- udes a backless life jacket, 1 ggings with pockets for recog- nals, 2 bags of dye, a single ;naling pistol, 10 Marine-type cartridges, 1 airman's distress np, a signal flag, and a clasp ı contrast, American emergency equipment is contained in back pad kits or vests and our more extensive signaling equipment includes sea dye marker, whistle, pyrotechnics, flashlight, signal mirror, and signal panel.

The dinghy is made of balloon fabric and painted yellow similar to ours for better visibility on the water. It is inflated by liquid carbon dioxide only partially so as to be easier to board. The German technique is to swim on the

(*Continued on page 22*)

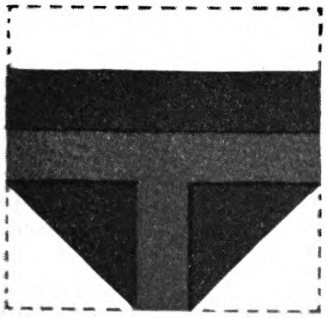
OXYGEN AND CO_2 COURSE

The installation, operation, and maintenance of oxygen and carbon dioxide equipment is a new training course set up for Navy enlisted men at the Naval Air Technical Training Center in Chicago. The course is of 2 weeks' duration. The first half of the program deals with all types of aviation oxygen equipment, and the second phase teaches the men the maintenance of typical CO_2 installations, such as fire extinguishers, cylinders, valves, emergency hydraulic landing gear, and smoke screen and vapor dilution systems.

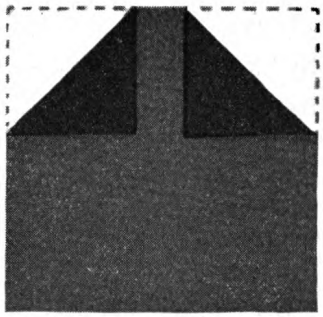
Additional Types of Equipment Received For Exhibit

(Nov. 1 to Nov. 30, 1944)

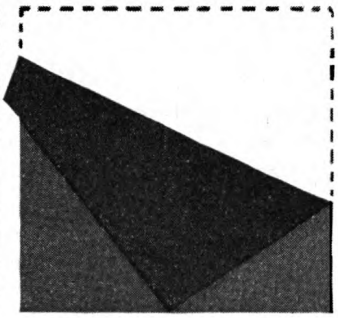
Catalogue No.	Object	Source
44.277.1–2	Sponge, bailing (2) Contract No. NXSA–57490	BuAer, Washington, D. C.
44.278.1–2	Flashlights (2) Model B & Model G	Geyarn Mfg. Co., Boston, Mass.
44.279.1	Aircraft, drift signal, night. AN MK. 4 (Inert), sectionalized.	Supply Officer, 164 Naval Ammunition Depot, Crane, Ind.
44.279.2	Signal, drift, night. AN MK. 5, Mod. 1 (Inert)	Do.
44.279.3	Aircraft float light, MK. 6 (Inert), Lot K–1944	Do.
44.279.4	Aircraft two-star cartridges, red, yellow, MK. 3, Mod. 3 (Inert).	Do.
44.279.5	Aircraft two-star cartridges, green into red-red, MK. 4 (Inert).	Do.
44.279.6	Aircraft two-star cartridges, red-red AN-M28 (Inert)	Do.
44.279.7	Aircraft emergency identification signal star, MK. 6 (Inert).	Do.
44.279.8	Aircraft emergency identification signal smoke, MK. 7 (Inert).	Do.
44.279.9	Fuze, time mechanical nose, M111A1 (Inert)	Do.
44.279.10	Cartridge slick marker, 1.5", MK. 1 (Inert) sectionalized.	Do.
44.279.11	Very's pistol cartridge, red, MK. 2 (Inert)	Do.
44.279.12	Depth charge marker, day, MK. 1, Mod. 1 (Inert)	Do.
44.279.13	Depth charge marker, night, MK. 2 (Inert)	Do.
44.279.14	Grenade, Hand Smoke, white, HC–AN–M–8 (Inert)	Do.
44.279.15	Very's pistol, MK. 5	Do.
44.280.1–3	Aviator's Kit, Individual First Aid	Commander Hohn.
44.281.1–17	Kit, first aid, aeronautic, complete (new Army type)	Fairfield Air Service Command, Patterson Field, Fairfield, Ohio.
44.282.1–6	Packet, First Aid, parachute, complete (new Army type)	Do.
44.283.1	One-Man Life Raft, British	Squadron Leader Smith, Canadian Joint Staff, Washington, D. C.
44.284.1–2.1–38	Raft, life, pneumatic, Type D, MK. IV, Spec. M–3R	Firestone Tire & Rubber Co., Memphis, Tenn.
44.285.1–2.1–43	Raft, life, pneumatic, Type D, MK. VII, Spec. M–3R	Do.
44.286.1–9	Flashlights, plastic, watertight, complete with batteries (9)	SO, U. S. Naval Aviatio Supply Depot, Philadelphia, Pa.
44.287.1–2.1–31	Raft, Mark II, Type D, Spec. M–3R	Air Cruisers, Inc., Clifton, N. J.
.294.1–8	Compass, magnetic, pocket type	BuAer, Washington, D. C.
.295.1–2	Knife, hunting; 2–5" blades, with sheath	Lieutenant Sanger.



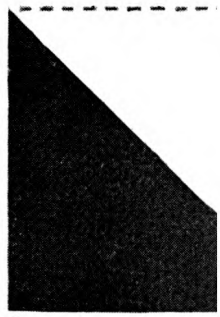
LAND: NEED QUININE OR ATABRINE
SEA: NEED SUN COVER



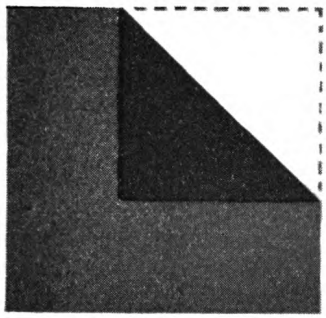
LAND: NEED WARM CLOTHING
SEA: NEED EXPOSURE SUIT OR CLOTHING INDICATED



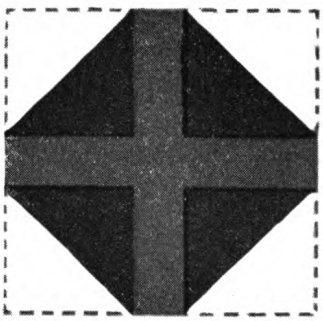
LAND & SEA PLANE IS FLYABLE. NEED TOOLS



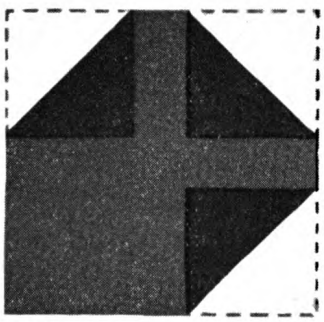
SEA: NEED EQUIPM INDICATED. S FOLLOW



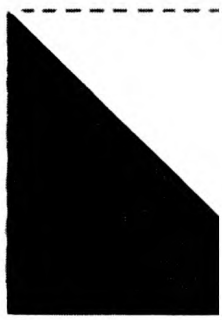
LAND: NEED GAS AND OIL. PLANE IS FLYABLE



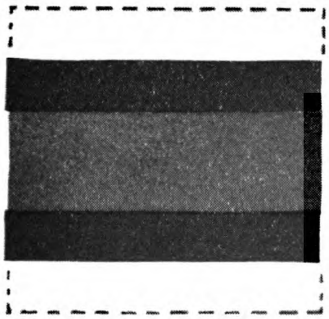
LAND & SEA NEED MEDICAL ATTENTION



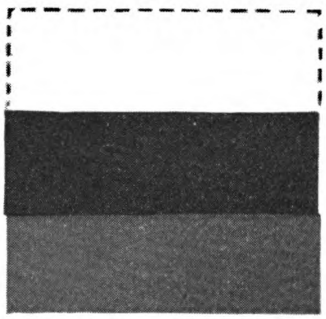
LAND & SEA NEED FIRST AID SUPPLIES



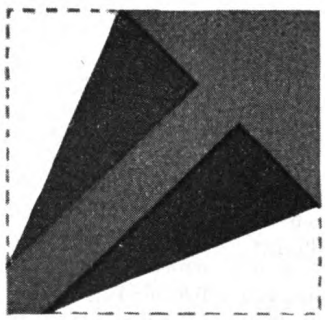
LAND & SEA NEED FOOD WATER



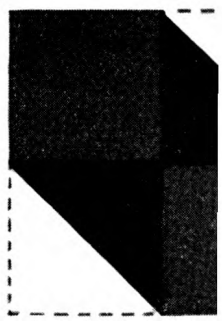
LAND: INDICATE DIRECTION OF NEAREST CIVILIZATION
SEA: INDICATE DIRECTION OF RESCUE CRAFT



LAND: SHOULD WE WAIT FOR RESCUE PLANE?
SEA: NOTIFY RESCUE AGENCY OF MY POSITION



LAND & SEA OK TO LAND. ARROW SHOWS LANDING DIRECTION



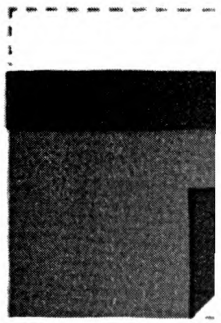
LAND & SEA DO NOT ATT LANDING

SURVIVORS' SAIL SIGNALS

Use of the standard life raft paulin or sail carried in emergency equipment has been expanded for signaling to overhead rescue craft from the sea as well as the land. Navy Technical Note No. 91–44, issued 16 October 1944 by the Bureau of Aeronautics, standardizes a system of messages for communicating survivor needs. These signals are made by folding the life raft sail or paulin to indicate the messages shown in the accompanying plate. The paulin, which is also used for a sail, protective cover, or camouflage, is arc fluorescent yellow on one side and blue on the other. (Yellow is indicated by the darker areas in the half-tone; blue is the lighter.)

Meanings for the signals were chosen with care and represent the most frequently occurring needs of survivors on land or sea.

Except for the blue triangular panel, "Signals Follow," these signals are standard for both the Army and Navy.



HAVE ABANDONE
LAND ... WALKIN
SEA } THIS DIRECT
DRIFTIN

[AN ONE-MAN RAFT IS COMPARED

(*Continued from page 20*)

iat the upper part of the body
·ted above water by the life
The swimmer raises his legs,
ghtly inflated dinghy is drawn
· body.

· INSTRUCTIONS

lowing instructions are given
ıse of the recognition signals
ı the pockets of the airman's
He should take a bag of dye
ıocket and hang it over the side
aircraft is seen or believed to
vicinity. If it is evening or
ashlight is used automatically
)S signals. The yellow signal
so used in the daytime.
an one-man parachute type life
ıe in three models—An–R–2a,
and C–2. The An–R–2a or b,
Army and Navy flyers, may be
h either the seat-type para-
:he quick attachable chest-type
:. With the former, the raft
l between the chute and the
dy in place of the parachute
ion. If the flyer is wearing
parachute, the raft is stowed
the QAC parachute and his
:fore flight the raft is attached
ıp ring of the life vest. When
is worn with the seat-type
· raft is released in the water
pping the leg straps of the
ıd allowing them to go through
in the raft case. When the
st leaves his harness, the raft
ree.
'araft is inflated by pulling the
n and twisting the CO_2 valve.
becomes fully inflated, which
ɔm the German version, and
be topped off by using the oral
ube. The Army C–2 one-man
ttached to the harness of a
back-type parachute.
parachutes are equipped with
lease buckle. On submerging,
ın airman presses the buckle
hands, the straps fall apart,
ırachute opens the press studs
oss straps, so that only the
:aining the dinghy remains.
:r inflates the dinghy by pull-
ggle on the CO_2 flask while the raft pack is still on his back. The carbon dioxide coming out inflates the dinghy and pushes it out of its pack. The dinghy remains attached to the pack, however, by the flask connection.

NOTE.—The above article was based on a report from Great Britain, Ministry of Aircraft, R. T. P. Translation No. S1524 (Report No. A2167–44, Commander, U. S. Naval Forces in Europe, 23 October 1944, Enclosure 11). Photographs are included.

Universal Survival Vest Adopted by AAF

Prepared by Arctic, Desert, and Tropic Branch

Newest addition to the growing line of emergency kits is the Vest, Emergency Sustenance, type C–1, developed by the Personal Equipment Laboratory, Air Technical Service Command, Wright Field, Dayton, Ohio. The C–1 Vest is designed to provide, on the person of the wearer, universal survival equipment for use over an extended period.

This new emergency kit places great emphasis on the individual's ability to live off the land. Equipment for hunting and fishing highlights its many unique items; included among them is a complete set of fishing tackle, with hooks to fit anything from sardines to sharks, and a spear for use if all else fails. For small game, such as rabbits, squirrels, and birds, a package of shot cartridges has been introduced—the first ever made to fit the .45 automatic pistol.

Designed to fit under all types of parachute harness, the vest kit occupies the smallest possible space. Items of equipment are evenly distributed in marked pockets.

Other interesting articles include a flexible canteen made of transparent, tasteless vinylite; this holds 3 pints of water and was designed with a specially wide, flat neck, to facilitate filling from shallow streams. There is also a reversible hat of two colors (OD on one side and yellow on the other), a mosquito headnet, gloves, signal mirror, plastic whistle, sewing kit, compass, matches, fire-starting tabs, insect repellent, and 2 pocket knives, the larger of which has a 5-inch saw blade capable of cutting airplane steel.

The entire vest can be submerged for hours without harming its contents.

USE OF HOMING PIGEONS IN RESCUE

(*Continued from page 18*)

Pigeons, when fully trained, can fly 12 to 15 hours steadily with an average speed of 25 to 30 miles an hour. A favorable tailwind will make greater speeds possible. The semi-impermeable plumage of the homing pigeon serves as a protection from water, and the birds may be released into misting rain or light showers, but it is not advisable to release them in a heavy rainfall. A pigeon is not affected by cold temperature, but is susceptible to drafts. Recent experiments show that pigeons may be trained to fly at night.

Careful training has done what many people previously had considered impossible—it has successfully changed the home address of homing pigeons. Before this time it was not thought possible that adult pigeons could be moved thousands of miles and taught to "home" on a new location within a few weeks' time. This procedure is particularly advantageous for tactical operations. With a fast-moving outfit the pigeoneers adopt the leap-frog process, with one loft operating and another in front "settling" the birds. As troops move forward, the loft is jumped as in a checker game so there is always one operating and one ahead getting ready. As training progresses it is possible that the ultimate tactical value of these war birds is yet to be realized.

Experience shows that a pigeon can be released from an altitude of 35,000 feet and a speed of from 300 to 400 miles per hour, and still suffer no bad effects from the low temperature or the lack of oxygen. To aid in escaping the force of the slip stream, the bird is placed head first in a paper bag that is slit down the side. The pigeon is faced in the direction the plane is flying, and may be tossed out and down from the stern hatch of the plane. The bag will hold together long enough to insure that the pigeon clears the plane. Other birds with the same message may be released after the plane has ditched or made a forced landing. If time is short, the pigeon may be released without a message, and the loft pigeoneers will check the bird's leg band, ascertain the number of the plane to which it is assigned.

SURVIVAL INSTRUCTOR'S PHAS

ONE PART OF NAVY'S SURVIVAL TRAINING PROGRAM FOR AVIA

The Navy Survival Training Program for Instructors is an innovation in the field of survival study. This training, sponsored by the Physical and Military Training Section, and given last fall to 80 men, is intended to broaden the background of their officers now teaching some phase of Survival and to train additional officers to fulfill the requirements of the continually expanding program.

The course of instruction followed the progressive preflight, primary, intermediate, and operational survival training given to cadet pilots with additional reading assignments, field work and methods of training. Three sections of the country which afforded suitable topographical areas for survival training were the centers for this instruction. At the Navy Preflight School in Chapel Hill, N. C., the potential "experts" were initiated into the field within 12 days of introductory land and sea survival followed by 9 days of further indoctrination at the Naval Air Station at Pensacola, Fla., and the course concluded with a week of tropical survival methods at the Opalocka Naval Air Station near Miami.

JUNGLE SURVIVAL TRAINING

The training at Chapel Hill oriented the men to the preflight survival program. The first week followed a pattern of lectures, films, slides, and reading assignments in the training textbook, *How to Survive on Land and Sea*, during the morning hours, and a daily field trip in the afternoon for practical application of the survival procedures. The second week consisted entirely of a field trip in the surrounding country which, with its densely wooded areas, ridges, valleys, swamps, and rivers, lends itself realistically to jungle survival training. During this time techniques already demonstrated were practiced under actual survival conditions.

The lectures covered every phase of survival—its importance, the need for being prepared, equipment and improvisations, how to search for food and test it intelligently, food sources, how to travel and keep a course, methods of signaling, water travel, swimming, and other basic subjects. The first field work featured individual first aid and safety with a demonstration of bandages, compresses, and slings. In addition, the men learned how to control shock and hemorrhage, how to tie many useful knots, and to use the axe, machete, and knife.

EMERGENCY FOOD AND WATER

The second field trip entailed map and compass work. Each man received a compass and aerial map of the surrounding country and was shown how to read it, how to orient it, and how to determine his desired course of travel. After instruction in travel techniques and hiking in rough wooded country, his map was marked with definite objectives such as stream bends, cliffs, and fields which he must reach on a prescribed course without deviation to avoid streams, swamps, or other natural barriers. On the way he learned to use the sun, landmarks, and bush marks in keeping a course, how to tell direction with a watch, and the best methods of teaching these skills to cadets.

The next four lectures covered wild plant food—its importance, distribution, poisonous and irritating substances, and animal food, fire making, cooking, and shelter. Then the classroom work on water and food was put to practical use in the field. The instructors demonstrated methods of searching for food by emphasizing observation, the value of habitat recognition, and plant and animal indicators. Plants that are common in other parts of the world were pointed out, as well as how to recognize and use them. The men learned by preparing, cooking, and eating them that the leaves, stems, sap, buds, roots, and fruits of certain plants are all potential food sources. In fact the instructors emphasized that they may be a survivor's bill of fare for many days. Mussels, crayfish, turtles, salamanders, frogs, snakes, and insect grubs also figure prominently in a survivor's diet and the men were shown where to find these delicacies.

Water is one of the most important factors of survival and the su well covered during this trip. learned how to obtain water fr how to dig for good drinking low river flood plains; how to plants that act as water reserv how the presence of certain p animals indicates the nearness In addition they were show make water potable by clarifyi cactus leaves; deodorizing w coal; filtering it with cloth, grass; boiling it in canteens a shift vessels; and purifying lodine and halazone tablets.

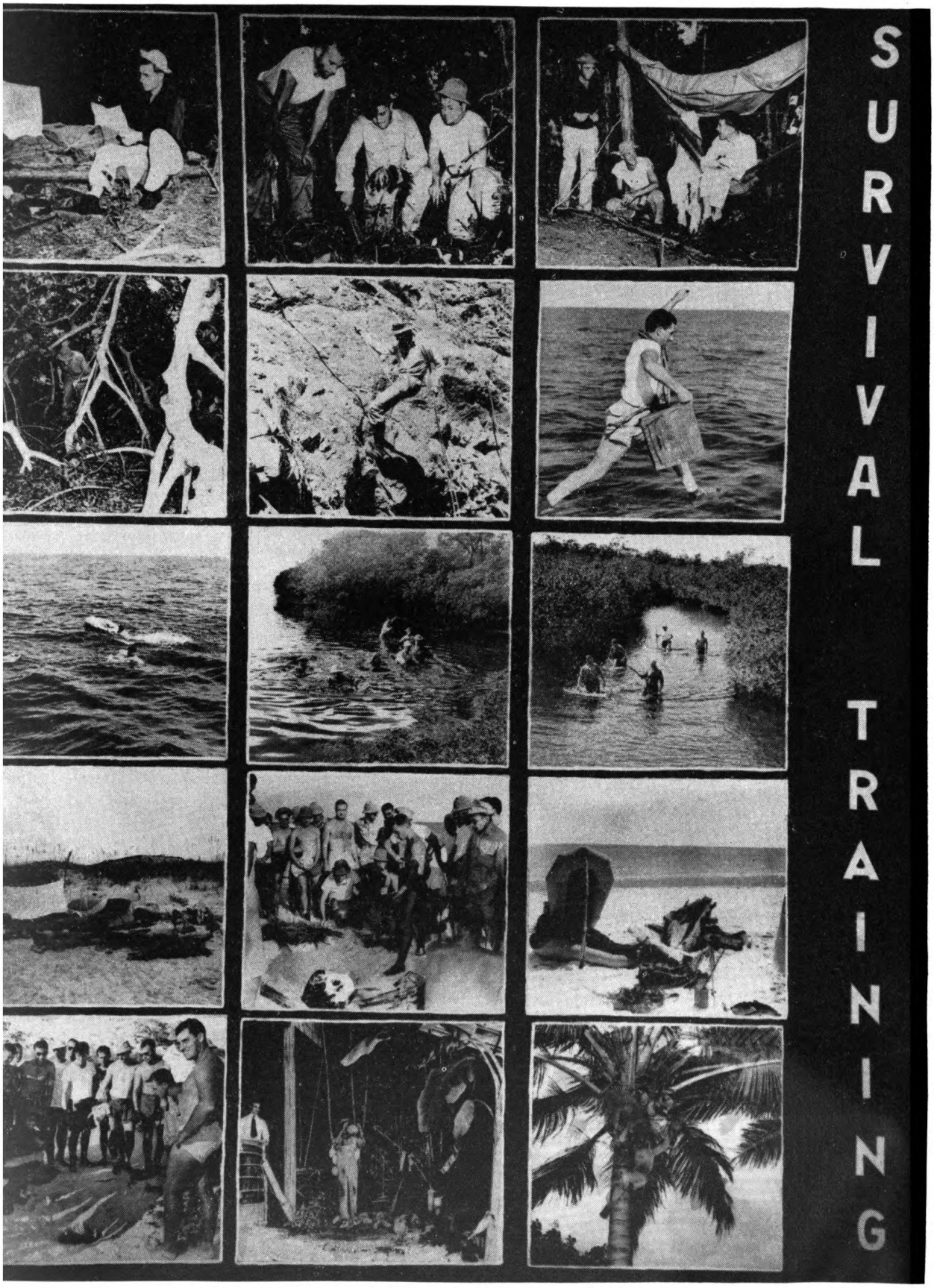
The last three lectures of introduced the trainee to the h side of a survivor's life. H aware of the innumerable phy ards to be met—heatstroke an tion, snow blindness, water strenuous exertion, and effect He practiced elementary firs blisters, insects, cuts, and plants. He became familiar ological hazards such as m malaria, fungus infection, harm mals, poisonous and dangero animals, plants poisonous to touch, and imaginary dangers sometimes the hardest to mee

The final field trip of this week offered training in climb niques, rappelling and rope hike was made to a cliff loca quarry. Here the men pract pelling down a cliff, rappelling tree, making rope from shroud lines, rock climbing me cautions, and lowering a ma cliff using a Spanish Bowline.

SIX-DAY FIELD TRI

The second week of in plunged into field work on a la A 6-day trek was made thr rugged, surrounding woods wit mum of equipment consisting sack, sleeping bag, canteen, compass, maps, tent hat, mosqu net, and K rations. Individual was the order of the day and were put on their own to pra techniques of living off the lar methods, building shelters, im

(Continued on page 25)



equipment, etc. Group instruction was given also, stressing the teaching angle in survival techniques, preparing training camps, setting up instruction courses, and building demonstration areas.

The permanent camp site was the first objective of the trip. Here the men observed camp organization, administration, and the factors to be considered in selecting a permanent training camp site. Later in the day they explored the demonstration area which exhibits the many kinds of snares, shelters, campfires, and other survival equipment. The same evening the men went out on a short night hike to practice navigation by map, compass, and stars. They started out around 5 in the evening, hiked to their objective, cooked their supper, and hiked back to camp after dark. The route followed intersected wooded and open country, a stream, swamp, and ridge. When following one of the several different bearings, the men used only the stars and skyline to keep course. Several of the California trainees, used to the mountainous topography of the coast ranges, went past their objective in the dense undergrowth and almost completed the next day's hike before they realized they were off their course. But one of the navigational instructors managed to top all the mistakes made that night by walking over an 8-foot drop in the dark while trying to orient himself by the stars.

The next day another compass hike was made to a camp site at Edwards Mountain. The first thing that the men attended to on reaching camp were the blisters on their feet rubbed in during the morning hike. Then the men made camp and set snares on runways, game trails, and over logs crossing streams. After this was done, they constructed bough beds, different types of shelters, and gathered wild plant foods such as the wild sweetpotato, blackberries, blueberries, American pawpaws, and wild greens. The evening was passed around the fires with a lecture and discussion. In the morning the snares were lifted and camp broken before starting another cross-country hike to the Haw River camp site for a 3-day stop.

HAW RIVER CAMPSITE

At Haw River the men acquired skill in fishing and set night lines along the river for eels and catfish. In the morning the lines were lifted for catch and the instruction in fishing ended with a demonstration of cleaning and preparing fish and making bark fishing lines. The rest of the day was spent by the men on individual forage trips. Each man on his own had to bring back 10 feet of bark fishing line, K-ration key fishhook, one frog, fish, or snake, a freshwater mussel, an Indian turnip tuber, a solomon's seal root, and one cupful of silver berries.

The next day they practiced tree climbing, stalking techniques, and the various methods of crossing streams, swimming in rapids, and making rafts. Their rafts had to be usable, too, because their next assignment called for them to cross the river on the raft and make individual camp on the far side for the night. The same night a big storm came up suddenly and caught a few of the men unprepared. The more foresighted individuals, however, were proud of the fact that they had anticipated the weather and slept dry.

The remainder of the field work back at the base comprised water survival, physical training, and hand-to-hand combat techniques. Physical training included climbing ropes, jumping, tumbling, safety falls, cargo net, and parachute agility. Hand-to-hand combat taught the proper stance, the parts of the body as weapons, fundamental holds, the frontal and rear attack, kicking maneuvers, disarming, and offensive methods for possible use in enemy escape and evasion. Thus ended the first phase of survival training.

PENSACOLA

Here the future instructors received instruction with emphasis placed on specific survival knowledge pertaining to particular areas—at sea, along the seashore, and in the arctic. The training included advanced lectures in various fields (Flight Safety, Medicine and Flight, Parachutes, the Arctic, etc.) by men well versed in their profession with practical demonstrations in which the individual trainee took an active part. Training films, illustrated lectures, and study of the techniques displayed in the Survival Training Exhibit supplemented this work.

Intensive instruction was given at the Naval Air Station in Air Sea Rescue training through lectures, demonstrations, and actual practice. The men were taught the use of Air Sea Rescue emergency equipment and ho it in planes. Flight emergenc covered parachutes and their ferent types of planes; the t ciples of jumping, descending, ing; ditching procedures; distress communications; an positions and postures. We ditching drills were conducted supervision of flight officers.

In addition the men learne Rescue organization and contr need for cooperation between and rescuers. This phase o was concluded with a simul using PBY's, fighter planes f tion, and crash boats to illus the various types of rescue un ordinated to effect a rescue. were stationed in boats, pla and control headquarters to o operational functions.

SEASHORE SURVIVAL T

The most interesting field at Pensacola covered a 24-h and emphasized survival a along the seashore. The me Air Station by motor launc minimum of equipment and n food. About a mile off Sant land the men simulated true vival by jumping overboard their rafts and paddling to sho the surf. On shore they w where and how to dig wells water and each man had to di They also learned how to cat crabs and the best methods them without utensils. Hu crabs were speared or otherw and an average of three to fo man was obtained. In additi shellfish, numerous plants, ar sum were caught and pre the second day the men we list of ten foods to find an The required foods were san bait, small clams for broth, fish, a sand crab for bait or food, a hermit crab, acorns f oak, a saw palmetto heart t raw or cooked, saw grass (ba eaten raw), edible nutlets of bullrush, and ground cherr plum. Most of the men hope more time on the beach b night of sleeping on the sand of working in the terriffic heat they were very happy to le appointed hour. Working in ing heat all day with no shade

a realistic taste of what sur-
ıg the seashore is really like.
d work at Pensacola included
ıe use of kits, handling and
ıg poisonous and edible fish.

I TROPICAL TRAINING

ami course of instruction con-
olly of practical field training
ng tropical survival.
inees spent the entire first day
ıapman Field Plant Introduc-
ien learning how to construct
vpes of tropical shelters and
ı palm fronds, how to thatch
how to use the all-purpose co-
ıe men sampled the water from
green nuts and ate coconut
outs, grated meat, and palm
They learned to climb coco-
to husk coconuts, and to make
useful articles that can be
from this versatile plant.
practiced making eye shades,
es, sandals, and clothing from
ut husks, fronds, and coconut
:xt they saw a demonstration
ses of bamboo. Then they
ıow to construct water and
'ontainers from bamboo and
aves, and how to build a bam-
ıed, drying rack, and fish spear
s of bamboo utility. The rest
rning was taken up with cook-
ire making. The men discov-
se of bamboo fire saw and rat-
ıong and learned how to pre-
pical plant foods such as
hoots, jak fruit seeds, candle
ı taro. The afternoon was
earning to recognize and use
cal plants as the various spe-
ms, pandanus, Indian almond,
ople, and cassava.
:ognition and use of tropical
s again the feature of the day
irchild Tropical Gardens and
ıg estates. In the afternoon
ip was made to Chapman Field
tical examination. Each man
ted the techniques he learned
efore. These included climb-
ut trees; opening coconuts;
and cooking taro, palm cab-
ı weevils, and land crabs; and
banana leaf container, a bam-
ng vessel, a fish spear, palm
'et, and an Agave fish line and
t.
t day's instruction took place
:ove area and the men learned

(*Continued on page 27*)

PUBLICATIONS RECEIVED

Air Sea Rescue Agency Technical Library
November 6–December 6, 1944

ABSTRACTS

Buoyant Material for Life Preservers.

October monthly progress report in the testing of buoyant materials for life preservers conducted at Mellon Institute of Industrial Research. Experiments to determine relative buoyancy of Fiberglas, treated wool, and dewaxed kapok under varying conditions are in progress with preliminary tests to investigate percentage loss of buoyancy caused by (1) design of the pad, (2) degree of compression of fibers. Storage tests were made on cellular synthetic rubber under increased temperature and pressure and results included. Tables are inserted showing buoyancy test results of the different samples under various conditions. Further information is expected as the experiments and tests progress.

SOURCE: National Research Council, Monthly Progress Report Project AN–20, October 31, 1944. Buoyant Material for Life Preservers OEMsr 1055/AN 20. (Restricted.)

Sunburn Preventives for Use on the Lips.

Report on field acceptance test to determine the most acceptable of 3 protective preparations, 2 lipsticks and an ointment, concludes that "a lipstick is preferable to an ointment preparation." The preparations were applied to the lips and nose of 72 test subjects, the preparations being rotated for 3 days. The subjects were exposed to hot weather with temperatures above 90°, bright sunlight, and salt water spray.

SOURCE: Medical Field Research Laboratory, Camp LeJeune, N. C. (M & S Research Project # X–108B).

Report Survival Equipment Tests.

Report covers experiment conducted by Seventh Air Force to simulate as closely as possible raft survival conditions in Central Pacific area. Four men adrift for 5 days in an A–3 raft to determine the durability and efficiency of both Army and Navy equipment available in that theatre of operations. Daily authoritative medical records were kept by a medical corpsman who visited the raft three times a day to check physiological effects of the experience. All equipment was tested and recommendations are included for its improvement. Actual photographs and diagrams are inserted throughout the report.

SOURCE: Report Survival Equipment Tests, Director of Intelligence Seventh Air Force, APO 953. Experiment conducted 27 August–1 September 1944. (Restricted.)

MISCELLANEOUS

The Official Guide to the Army Air Forces, AAF; a directory, almanac and chronicle of achievement. New York, Simon and Schuster, 1944.

Register of Commissioned and Warrant Officers of the United States Naval Reserve. July 1, 1944. Washington, D. C., U. S. Govt. Print. Off., 1944.

AIR-SEA-LAND RESCUE SERVICE

U. S. Army Air Forces (4th).

. . . *Emergency Rescue Operations, Search and Rescue.* San Francisco, Calif., 1944. (Restricted.)

Mayday . . . Fourth Air Force Memorandum No. 57–1. San Francisco, Calif., 1944.

U. S. Coast Guard Air Station, St. Petersburg, Fla.

Crash and Rescue Reports. 1944.

U. S. Coast Guard Air Station, San Diego, Calif.

Air Sea Rescue Manual, prepared by Air Sea Rescue Task Unit . . . 1944. (Restricted.)

Western Sea Frontier, Southern California Sector.

Circular Letters. San Diego, Calif., 1943–44. (Restricted.)

. . . *Quarterly Recapitulation of Offshore Crash Statistics,* January through March, 1944; April through June, 1944. San Diego, Calif., 1944. (Restricted.) Mimeographed.

DITCHING

U. S. Army Air Forces (7th).

Forced Landing of Aircraft at Sea—"Ditching." Multi-engined Aircraft, Central Pacific Area. 1 September 1944. APO 953, Headquarters Seventh Air Force, Office of the AC of S., A–2, 1944. (Restricted.)

EMERGENCY EQUIPMENT

Davis, Walter G.
Test of Lightweight Exposure Suits at Plymouth, Mass., on 6–7 Aug., 1944. Washington, D. C., U. S. Air-Sea Rescue Agency, 1944. Typewritten.

Naval Research Laboratory, Anacostia Station.
. . . *Final Report on the Use of Chemical Materials as Shark Repellents.* Washington, D. C., 1944. (Restricted.)

Spealman, C. R.
Field Tests of Exposure Suits at Plymouth, Massachusetts, 7, 8, 9, Aug., and Halifax, Nova Scotia, 10, 11, 12 August 1944. Bethesda, Md., Naval Medical Research Institute . . ., 1944. Typewritten. Dated: 15 August 1944.

U. S. Army Air Forces Board.
. . . *Emergency Vest, Type C–1.* Project No. (M–4) 561 . . . 9 September 1944. Orlando, Fla., 1944.
. . . *Kit, Desalting Permutit No. 1 and Still Solar Floating Vinylite Bag Type.* Project No. (M–4) 521 and (M–4) 595 . . . 22 August 1944. Orlando, Fla., 1944. Processed. Inclosure 6: ". . . Drinking Water Supply on the Ocean." Inclosure 7: "Sunshine-Operated Stills and Rainfall as Sources of Water for Life Rafts." (Restricted.)

U. S. Coast Guard.
Specification for Signaling Mirrors. Washington, D. C., 1944. Mimeographed. Dated: 27 April 1944.

U. S. Maritime Commission, Research and Specifications Branch.
. . . *Report of Investigation of Fastness to Weathering of Certain Fluorescent Orange Colored Coating on Cotton Fabrics.* Washington, D. C., 1944. Dittoed.

LIFE RAFTS AND LIFEBOATS

U. S. Army Air Forces (4th).
Demonstration of A–1 Air-borne Lifeboat. San Francisco, Calif., HQ Fourth Air Force, Public Relations Office, 1944. Mimeographed.

LOCALE INFORMATION

Jungles of Sumatra with Reference to Animals, Diseases, and Plants Harmful to Man . . . 30 August 1944. AAF Intelligence Report K–73982. (Restricted.)

U. S. Air Transport Command, Central Africa Sector.
Pilots' Guide . . . (Africa, Arabia, India). 1943. (Restricted.)

PIGEONS

U. S. War Dept.
. . . *The Homing Pigeon.* Washington, D. C., U. S. Govt. Print. Off., 1940. *Its* Technical Manual, TM11–410.
. . . *Signal Pigeon Company.* Washington, D. C., U. S. Govt. Print. Off., 1944. *Its* Field Manual FM11–80.

TRAINING

U. S. Navy Dept., Aviation Training Division.
Pilot Error Sense . . . Washington, D. C., U. S. Govt. Print. Off., 1944.

WIND DRIFT

U. S. Hydrographic Office.
Methods for Locating Survivors Adrift at Sea on Rubber Rafts, H. O. 235. Issued by the Hydrographic Office, U. S. Navy Dept., November 1944. Washington, D. C., 1944. (Restricted.)

CANDLEPOWER LEARNED MIRI

A letter from the Nationa Standards reveals the follov

On page 339 of the eighth the Smithsonian Physical T lished by the Smithsonian it is stated that the bright disk of the sun when obse earth's surface on a clear 000 candles/cm². If observe tion in a mirror having a flectance of 0.90, the bright disk will on this basis be dles/cm². If the flashes of flected by the mirror are seer than several hundred feet, the case in mirror signalin of the sun fills the small sig ror. The mirror then beha ondary source of light havi ness equal to 148,500 candl projected area in square ce

The Signal Service Corpor of the Learned signaling m mirror area of 67 square which for light incident 45° f will produce a beam of 47 s meters cross section, and fo dent 65° from normal will beam of 28 square centimete tion. Multiplying each of t by 148,000, we find that the the mirror appears to be 7, dles, or greater to any obse 90° of the sun, and it appea 4,000,000 candles when the 130° from the sun at abou est angle in which the ne effective.

Fruit-flavored Ca

It has been suggested by o the fruit-flavored candies i ration be added to water m desalting kit to increase its

SURVIVAL INSTRUCTOR'S PHASE

(*Continued from page 26*)

travel techniques and methods of obtaining fish and shore foods in such areas. The training here consisted of a quarter-mile hike forcing a path through the mangrove; a mile hike traveling the easier tidewater channels; methods of swimming in muck and mud; and finding food such as coon oysters, mangrove snappers, and stone crabs. A trip was made to a native jungle area in the afternoon and the men practiced hiking through the jungle with and without a compass, obtaining water from air plants, and in general got the feeling of traveling through tropical vegetation.

The final day started out with an inspection of the Naval Air Station rescue and salvage gear followed by a trip to the Everglades for a demonstration of pilot rescue and plane salvage operations by the swamp weasel, alligator, sea sled, and caterpillar tractor. The afternoon trip through swa cluded the Miami survival this excursion the men were best travel techniques for the instructors pointed ou snakes; and the men colle foods such as frogs, fish, a

All that remained then w examination. By this time fore, the future instructo their importance in the field and also that someone w when he coined the phrase, the Fittest."

WAR DEPARTMENT
AAF FORM NO. 16
APPROVED 1 NOV 1944

CLASSIFY IN ACCORDANCE WITH AR 380-5 DATED 15 MARCH 1944 WHEN ENTRIES MADE HEREON

DATE OF REPORT

AF OR AAF COMMAND

☐ DITCHING ☐ BAILOUT (LAND) ☐ BAILOUT (WATER) ☐ CRASH LANDING

EMERGENCY RESCUE REPORT

USE BOXES MARKED [W] ONLY FOR EMERGENCIES AT SEA

THIS QUESTIONNAIRE WILL BE COMPLETED FOR EVERY DITCHING OR BAILOUT AT SEA, AND FOR EVERY CRASH LANDING OR BAILOUT IN TERRITORY SO ISOLATED THAT SURVIVORS FACED AN EMERGENCY SITUATION. THE INFORMATION SUPPLIED WILL BE USED BY ALL AIR FORCE EMERGENCY RESCUE AGENCIES TO IMPROVE EQUIPMENT AND PROCEDURE. IT IS IMPORTANT TO THE LIVES OF YOUR FELLOW AIRMEN THAT YOU ANSWER ALL QUESTIONS AS COMPLETELY AND ACCURATELY AS POSSIBLE.

GENERAL INFORMATION

PILOT'S NAME	GRADE	ASN	TYPE AIRCRAFT	
ORGANIZATION	DATE OF EMERGENCY	TIME (GCT)	DATE OF RESCUE	TIME (GCT)
APPROXIMATE LOCATION OF BAILOUT, DITCHING, OR LANDING			LATITUDE	LONGITUDE

DESCRIBE CONDITION OF AIRCRAFT NECESSITATING BAILOUT, LANDING, OR DITCHING, AND CAUSE OF DAMAGE

WIND VELOCITY	DIRECTION	VISIBILITY	[W] HEIGHT OF SWELL	[W] DIST. CREST TO CREST	[W] EXTENT OF CHOP

DESCRIBE OTHER WEATHER CONDITIONS AT TIME OF INCIDENT

LIST PERSONNEL WHO BAILED OUT BEFORE LANDING OR DITCHING. GIVE REASON

[W] IF FIGHTER DITCHED GIVE CIRCUMSTANCES WHICH FORCED DITCHING INSTEAD OF BAILOUT

[W] HOW MANY HOURS OF DITCHING DRILL BEFORE INCIDENT?	[W] HAD CREW DONE WET DRILL? ☐ YES ☐ NO	[W] DID PILOT DRILL WITH CREW? ☐ YES ☐ NO	[W] HAD CREW SEEN A DINGHY INFLATED? ☐ YES ☐ NO

[W] IF ANSWER TO ANY OF ABOVE QUESTIONS IS NEGATIVE, GIVE REASON

FORCED LANDING

ALTITUDE DITCHING ORDERED OR CREW WARNED	POSITION OF WHEELS	DEGREE FLAPS USED	ENGINES FUNCTIONING	POSITION OF BOMB DOORS	HOW FAR DID PLANE ROLL OR SKID?

AIR SPEED FINAL APPROACH	AIR SPEED ON IMPACT	RATE OF DESCENT	[W] WAS TRAILING ANTENNA USED TO SHOW WHEN A/C WAS CLOSE TO WATER? ☐ YES ☐ NO	[W] RESULTS

EQUIPMENT JETTISONED

DESCRIBE LANDING - RELATION TO WIND AND SWELL, ATTITUDE OF PLANE, USE OF ENGINES, ETC., IF LAND, DESCRIBE TERRAIN.

RADIO & DISTRESS PROCEDURE

WAS SOS BROADCAST? ☐ YES ☐ NO	IF NOT GIVE REASON	ANTENNA USED	BAND(S) USED	MF: HF: VHF	IFF DISTRESS USED? ☐ YES ☐ NO

EQUIPMENT USED AFTER LANDING	STATIONS CONTACTED

WAS FIX OBTAINED? ☐ YES ☐ NO	GIVE DETAILS

AFTER LANDING

DESCRIBE DAMAGE TO AIRCRAFT

[W] ATTITUDE OF AIRCRAFT AFLOAT	[W] PERIOD A/C FLOATED	[W] PRINCIPLE ENTRY OF WATER	HEIGHT OF WATER OR EXIT

LIST TYPE DINGHIES AND/OR EMERGENCY EQUIPMENT CARRIED IN AIRCRAFT (CIRCLE ALL EQUIPMENT SALVAGED OR TRANSFERRED TO DINGHIES)

[W] DESCRIBE INFLATION OF DINGHIES AND ANY FAILURE OF LIFE VEST

DESCRIBE ANY RATIONING INSTITUTED

DESCRIBE RESCUE (CONDITIONS LEADING TO AND TYPE OF CRAFT, ETC., USED TO EFFECT SAME)

CLASSIFY IN ACCORDANCE WITH AR 380-5 DATED 15 MARCH 1944 WHEN ENTRIES MADE HEREON

CREW MEMBER	INJURIES BEFORE DITCHING OR LANDING	INJURIES CAUSED BY DITCHING OR LANDING	EFFECTS FROM EXPOSURE OR IMMERSION	DITCHING OR LANDING POSITIONS TAKEN	ESCAPE HATCH USED	RESCUED

LIST ANY CRITICISM (BASED ON YOUR EXPERIENCE) OF RESCUE EQUIPMENT, PROCEDURE, AND PUBLICATIONS

Pilot or senior survivor will write brief report covering period between development of emergency and rescue. Others aboard will supplement this with any information unknown to or overlooked by pilot. Personnel separated from main party will submit report covering period of separation. These reports will cover signaling methods, rationing, food and water sources, etc., as well as daily report from time of emergency landing until rescue. If log was kept attach copy to this report.

AAF ADOPTS NEW RESCUE REPORT FORM

Army air Forces have adopted this new Emergency Rescue form for reporting all ditchings and bailouts. This is a facsimile of the form.

("THING A HORSE CAN DO"—*A Story Of The Helicopter*

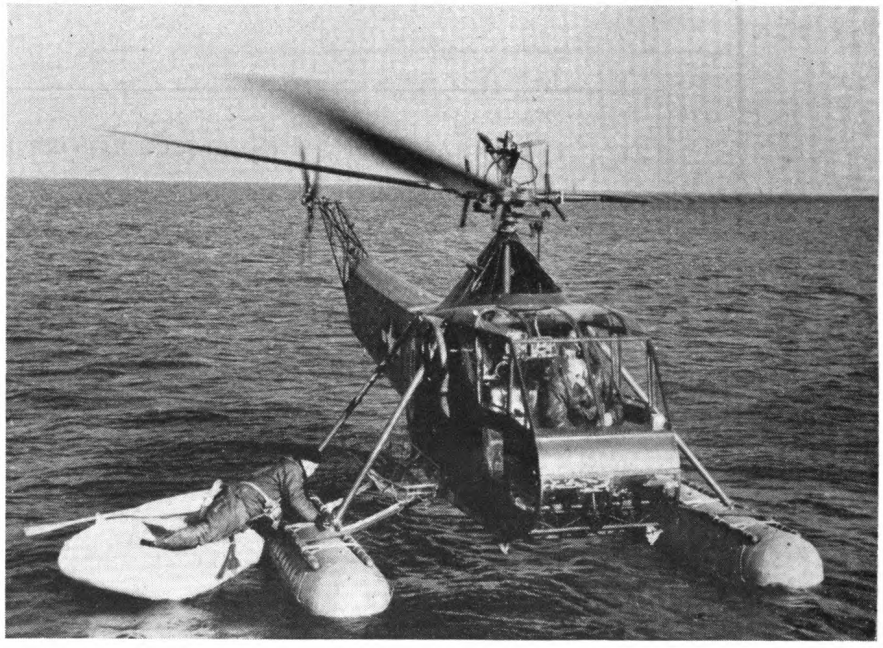
COL. H. FRANKLIN GREGORY, AUTHOR

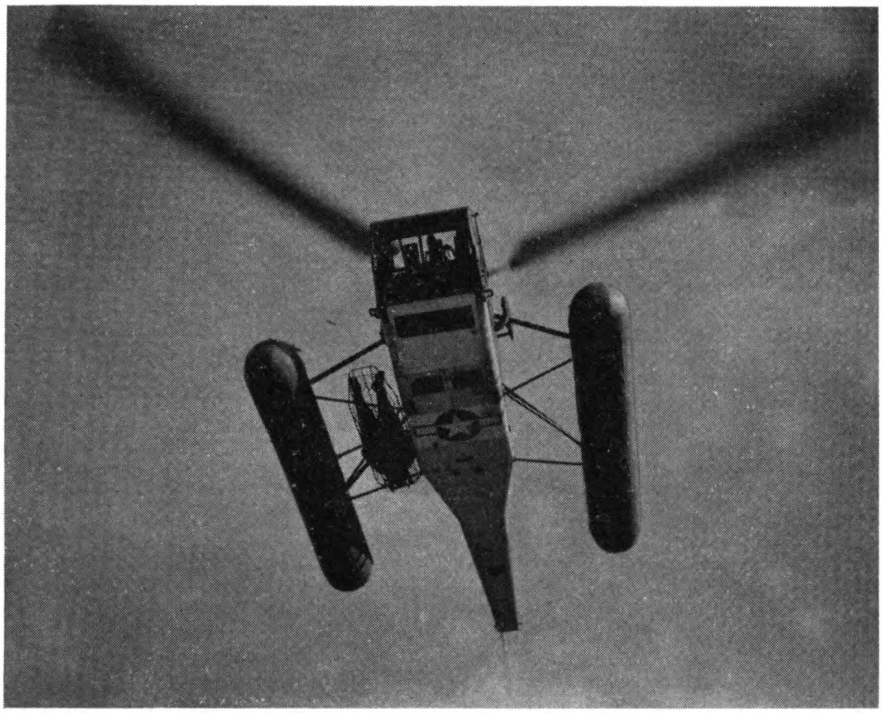
A BOOK REVIEW

s been written concerning the
e helicopter and its develop-
ng the last 3 or 4 years has
e speculation. Col. H. Frank-
y, who has contributed to the
nt of rotary-wing aircraft in
l States, unfolds his views
:y of the helicopter from its
ns to its possible potentiali-
e of this story is paraphrased
lowing review of the book,
a Horse Can Do."
een indicated that one of the
rtant missions of the rotary-
aft may be emergency rescue
delivery of necessary sup-

943 a Navy destroyer mysteri-
ded off the Jersey coast, kill-
f the crew and injuring scores
Surface rescue ships brought
ien to emergency hospitals set
eaches of Sandy Hook. Blood
s needed urgently.
a helicopter, Commander
Erickson, commanding officer
st Guard Air Unit at Floyd
ield, landed on the lawn of
ark and took the plasma
n a few minutes it was de-
helicopter to the wounded
:h. This is the first time the
vas used for emergency work.
her occasion a big bomber
o the dense swamp jungles of
rica, less than 100 miles from
base. None of the crew was
some were seriously injured.
plane spotted them from the
ed some supplies and later
ound-rescue party in a rough
ss than 25 miles from the
party. Cutting their way
e undergrowth . . . it
escuers nearly 2 weeks be-
reached the survivors and
same treacherous way back
ion with the wounded. *The*
could have accomplished the
day's time." In the future
may be available for just
ons.

NOTE.—*Helicopter illustrations in this article are pictures of a simulated rescue and have no connection whatsoever with the book "Anything a Horse Can Do," except to show a phase of possible use.*





The author then conjectures the probable procedure in effecting such a rescue: Loaded with medical personnel and first-aid equipment, the helicopter, operating from a base within a reasonable radius—or flown to a convenient location in a cargo plane—would fly to the scene of disaster.

Then, hovering over the spot. the medical men and supplies would be lowered to the ground by rope ladder. This is possible even in the thickest jungle. Once on the ground the men would clear a space, approximately 50 feet square, suitable for the helicopter to land. Equipped with from two to four litters, depending on the type helicopter employed, the machine could transport the wounded to the nearest

One of the advantages of to take off, hover at zero forv and land vertically, is that ε space in a wooded area becor ing ground. Because of this capacity for emergency sι evacuation is much greater type of fixed wing aircraft.

Some day, not too distar not be necessary to land the Fitted with special mechanic devices, now under developm be entirely possible to take th man aboard while the craf few feet in the air. Missio sort will be commonplace ε the rotary-wing craft is pι quantity.

Another possible use sugges craft is the establishment of radar installations. The hel fly to the distant stations an necessary radio, telephone, equipment, and at the same t the isolated crews with food necessities.

In a conservation program gested that the helicopter, fly nearly zero speed, could ena ical experts to spot plant dis the helicopter immediately, measures to prevent them fr ing. The helicopter, better sι job than airplanes, which alι been used, could transplant Government hatcheries to r hundreds of trout streams ε lakes.

The author ventures that tl questionably would be ideal f tion because it would enable to observe inaccessible reg closely.

Helicopters are described ε for convoying merchant ship independent troop vessels, coverage is impossible. Thei take off and land directly o ships could facilitate effecti marine patrol in those special In addition, an efficient anti and mine patrol could be ι over coastal and harbor regi

Among other uses contem courier work with rapidly mo anized forces, and observatic control. Besides these maj tions, the author discusses for the helicopter.

The title for this chronolo

:ted following a conversation
the author and a professor of
University.

)rse is an animal used for indi-
'ansportation," the professor
:d. "You can ride him from
t door to your destination. If
nto a blind alley you can back
If something is in your path
have him step aside. Or, if
ı reasonable obstacle in front
: can jump over it. The heli-
n do these things and more."
he comment is added, "It is
mechanical Pegasus."

ve research, interviews with
raries who have devoted many
the helicopter, and personal
: gleaned through years of ex-
ıtion with the helicopter, have
he author to write a composite
ing with its past, present, and
He does not overlook its limi-
· the problems yet to be solved
ill larger and more capable
's are designed.

Gregory points out that verti-
is older than aviation itself.
: thought of straight-up-and-
devices before he thought of
r or power-driven flying ma-
One legend goes as far back as
C. when a Persian monarch
l his slaves to build a chariot
nd harness to it domestically
agles whose powerful muscles,
ıt, would lift the machine into
and whisk him among the

ought and sporadic develop-
such a rotary-wing craft is
the book from the screw prin-
ated by Archimedes, through
da Vinci, first to discover the
controlled flight when he dis-
hat birds maintain their bal-
nanipulating the tips of their
wn to the present day.

l in an informal style, the au-
eriences with the Army's gyro-
d "growing pains" of the first
helicopters furnish an insight
)bstacles encountered and sub-
evelopments of all flying craft
by the Army Air Forces.

ıapter, illustrated with dia-
:plains "how" and "why" an
and helicopter fly. Another
xplains each step in handling
ols "from the time you enter
pter until you bring it safely
in the exact spot from which
off."

There are 32 full pages of photographs which, combined with the clearly written text, present a book that is of interest to both aviation experts and curious laymen who want to know more about the helicopter.

Lifeboat Radio Test

IN TIME of peace every merchant vessel is required to carry sufficient lifeboats to afford place for all of its passengers and crew. In the case of cargo ships full boatage must be provided on either side. In time of war boats are supplemented by life rafts, which can be skid-launched, and which will serve in some measure as a substitute for boats damaged or immobilized. Both lifeboats and the improved-type life rafts have been equipped to provide the highest possible survival and rescue expectation, by large increases in food and water and by increasing the required lifeboat buoyancy per occupant.

But even when all personnel of an abandoned ship have been safely seated in lifeboats and the boats are away from the ship, the eventual rescue of these personnel is only in its first stage. They still must be transported to land before their resources are exhausted. This may be done in one of two ways; either they may make their way to safety in their boats or rafts, or they may be picked up by some rescue vessel intentionally or accidentally coming upon them.

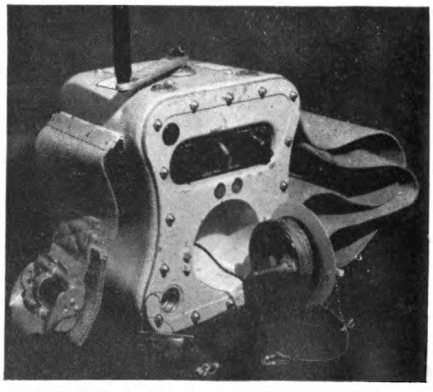
A merchant ship lifeboat, with a capacity load, is not the most efficient sailing craft. A moderate sea will set it to leeward and in a rough sea it must lie to. A raft, of course, even of the improved type, is much worse and will only sail broad before the wind. Navigational equipment is necessarily limited and compasses erratic. Although many cases have occurred where boats and even rafts have made their way to land after long periods of exposure, luck played a large part in most such cases, and we have no records of the numbers of boats or rafts which did not reach safety. Therefore, though every effort is made to give flotation equipment the maximum possible mobility, self-rescue efforts are considered to be definitely secondary to the effective provision for early rescue by other craft.

The first requisite of such rescue is the accurate location of the boats or rafts, in order that adequate rescue equipment may be directed to them. At present boats and rafts carry signal flags, orange-colored sails, daylight smoke signals, parachute flares, distress signals, and signalling mirrors. These, however, are only of value for attracting the attention of someone already within visual range, which is necessarily short. For longer range use each cargo ship is required to carry a portable battery-powered transmitter, capable of working on 500 kilocycles, which is to be placed in one of the lifeboats before launching, and which uses an antenna wrapped around a sprit for the mast. Transoceanic planes were equipped with a hand-operated automatic transmitter of the so-called "Gibson Girl" type. The provision of radio transmission greatly increased the range within which the distressed boats could attract attention.

But these boat or raft transmitters have very definite limitations due to being restricted to the 500-kilocycle band. This frequency is subject to serious interference by static, particularly in the tropics, and even under best conditions the sets will have a maximum range of not over 300 miles. The gain from this radio, while relatively great compared with visual signals, is still small in proportion to the areas of the oceans. The value of the 500 kilocycle frequency is that most seagoing ships are equipped with direction finders tuned to that wave and are therefore capable of locating a boat by its signals.

A high-frequency transmitter, by creating a long-distance sky wave, will give good signals over an area beginning about 300 miles from the set and extending up to 1,500–2,500 miles, depending upon conditions, but its ground wave will be inferior to that on 500 kilocycles. Further, the range of high-frequency transmitters will vary under day and night conditions for different frequencies. To insure complete coverage at all times without "skip" two differing high frequency bands must be used. With such equipment a boat's signals could be picked up at long ranges by shore direction finders and an area of position established, but since few ships or aircraft have high frequency direction finders, search craft could not make use of these signals.

(From "Proceedings of the Merchant Marine Council," No. 12.)



Modified SCR–578 transmitter.

U. S. GOVERNMENT PRINTING OFFICE: 1945

COMMITTEES FOR AIR SEA RESCUE

1. **Committee to Study the Preparation of Emergency and Survival Publications.**
   (Chm) CG: Lt. J. H. Bell, USCGR ADams 2003
   1516 14th St. NW.
   Army: Capt. Thomas Dunn, AC, Army 73050
   Room 4E 144 Pentagon
   Alt: Maj. K. O. Bennington, Army 74687
   AC, Room 4E 144 Pentagon
   Navy: Lt. Comdr. Norville W. White, Navy 4038
   USNR, 2W30 Bldg.–W.

2. **Committee to Study Adequacy of Air Sea Rescue Facilities.**
   (Chm) CG: Comdr. A. E. Harned, ADams 2003
   USCG, 1516 14th St. NW.
   Army: Maj. T. J. Borgman, Army 73538
   AC, 4E 144 Pentagon.
   Alt: Maj. William J. Small, Army 73538
   AC, 4E 144 Pentagon.
   Navy: Lt. C. W. Brown, USNR, Navy 61178
   Corcoran Annex, Rm. 305.

3. **Committee to Study the Communication Facilities and Requirements for Air Sea Rescue.**
   (Chm) CG: Capt. E. M. Webster, Navy 4444
   USCG, Rm. 7300 CG HQ.
   Army: Capt. J. M. Sherman, AC, Army 4847
   4E 144 Pentagon.
   Alt: Maj. T. J. Borgman, AC, Army 73538
   Rm. 4E 144 Pentagon.
   Navy: Comdr. C. L. Harding, Navy 63636
   USCG, Room 2541
   Navy Bldg.

4. **Committee to Study Special Aircraft Equipment for Rescue and Survival.**
   (Chm) CG: Lt. Comdr. J. D. McCubbin, USCG, 1516 14th St. NW. ADams 2003
   Army: Capt. Wilfred Hines, AC, Army 74687
   4E 144 Pentagon.
   Alt: Capt. Knute Flint, AC, Army 4847
   4E 144 Pentagon.
   Navy: Lt. R. J. Willingham, Navy 4038
   USNR, 2W32 Bldg.–W.

5. **Committee for Life Saving Equipment on Transports.**
   (Chm) CG: Comdr. R. A. Smyth, Navy 4374
   USCGR, Room 5316 CG
   HQ.
   Army: Major P. P. Fenwick, Arr
   TC, 3C 738 Pentagon.
   Navy: Lt. Comdr. J. L. Caillouet, Nav
   Jr., USNR, T4–2903.

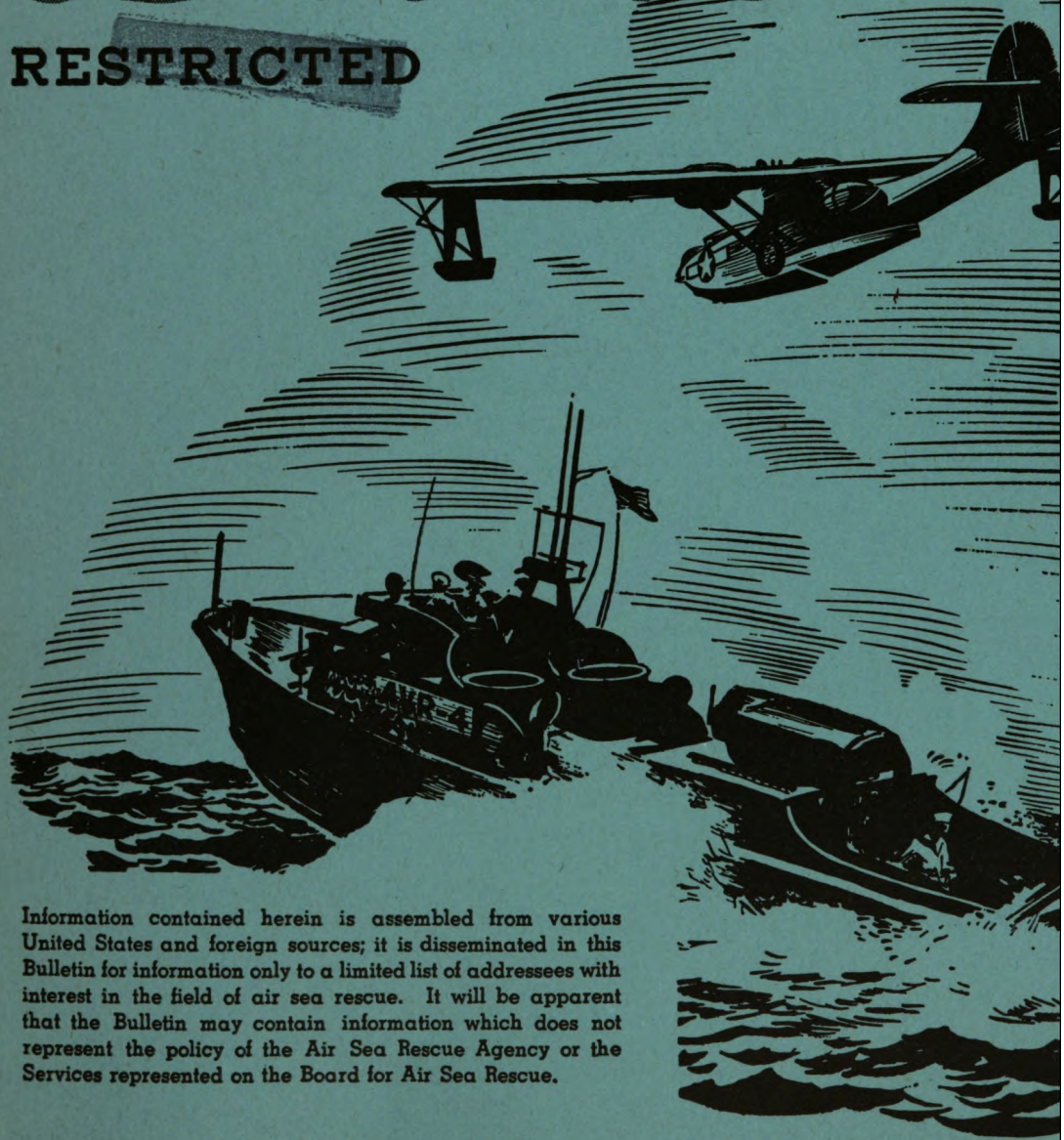
6. **Committee to Study the Medical and Physiologic**
   of Air Sea Rescue.
   CG: Sr. Surgeon Paul A. Neal, WIs
   USPHS, National Institute of Health, Bethesda, Md.
   Army: Maj. Frederick Fink, M.C. Arn
   ASF, Room 421, 1818 H St. NW.
   Army: Chief, Medical Safety Division, Office of Flying Safety, HQ, AAF, Winston-Salem, N. C.
   Alt: Major Richard Follis, MC, Asst. Chief, Medical Safety Div., Office of Flying Safety, HQ, AAF, Winston-Salem, N. C.
   Navy: Comdr. A. C. Hohn (MC), AD
   USN, 1516 14th St. NW.
   Navy: Comdr. Owen W. Chenault, Na
   (MC) USN, Room 2906, Navy Dept.
   Alt: Lt. Comdr. Henry Schroeder Nav
   (MC) USNR, Room 2906.
   Navy Dept.
   Alt: Capt. John H. Korb (MC), Nav
   USN, Room 28 PotAnn Bldg.–3.
   RAF: Wing Comdr. P. A. Lee, DE
   1424 16th St. NW.

7. **Committee to Study Ditching Procedures.**
   (Chm) CG: Comdr. A. E. Harned, AD
   USCG, 1516 14th St. NW.
   Army: Maj. K. O. Bennington, Arm
   AC, 4E 144 Pentagon.
   Alt: Capt. Thomas Dunn, AC, Arm
   4E 144 Pentagon.
   Navy: Comdr. Harry R. Horney, USN, Room 1802, Navy Bldg. Nav
   RAF: Wing Comdr. R. Bicknell, 1424 16th St. NW. DE

AIR SEA RESC

Bulleti

RESTRICTED



Information contained herein is assembled from various United States and foreign sources; it is disseminated in this Bulletin for information only to a limited list of addressees with interest in the field of air sea rescue. It will be apparent that the Bulletin may contain information which does not represent the policy of the Air Sea Rescue Agency or the Services represented on the Board for Air Sea Rescue.

Published monthly by the United States Coast Guar

AIR SEA RESCUE AG

WASHINGTON, D. C. No. 5

AIR SEA RESCUE AGENCY

R. R. WAESCHE, Vice Admiral
U. S. Coast Guard

W. A. BURTON, Commander, USCG
Executive Assistant to Head of Air Sea Rescue Agency

BOARD FOR AIR SEA RESCUE

C. V. WHITNEY, *Colonel*, U. S. Army Air Forces
J. W. BURGARD, *Lieutenant Colonel*, U. S. Army Air Forces
W. J. RENN, *Lieutenant Colonel*, U. S. Army Service Forces
JAMES R. DUDLEY, *Captain*, U. S. Navy
PAUL FOLEY, JR., *Commander*, U. S. Navy

SPECIAL DUTY STAFF OFFICERS, AIR SEA RESCUE AGENCY:
COMDR. A. C. HOHN (MC) USN.
MAJ. C. M. MURPHY, AC, ATC, Army of United States
CAPT. RUSSELL E. PIERCE, USMC (R)
LT. E. J. SANGER, USNR

AIR SEA RESCUE LIAISON OFFICERS

Commander R. L. Burke, USCG
Air Sea Rescue Liaison Officer
Commander Eastern Sea Frontier
90 Church Street
New York 7, N. Y.

Commander E. E. Fahey, USCG
Air Sea Rescue Liaison Officer
c/o Major P. Kraus
A. P. O. 925, HQ AAF
c/o Postmaster
San Francisco, Calif.

Commander J. F. Harding, USCG
Air Sea Rescue Liaison Officer
c/o Commander Gulf Sea Frontier
Dupont Building, Room 926
Miami, Fla.

Commander T. J. Harris, USCG
Air Sea Rescue Liaison Officer
c/o Commander Western Sea Frontier
Federal Office Building, Room 480
San Francisco 2, Calif.

Commander A. J. Hesford, USCG
Air Sea Rescue Liaison Officer
Commander U. S. Naval Forces in Europe
c/o Fleet Postmaster
New York, N. Y.

Commander C. B. Olsen, USCG
Air Sea Rescue Liaison Officer
c/o Commander South Pacific Force
c/o Fleet Post Office
San Francisco, Calif.

Commander, W. B. Scheibel, USCG
Air Sea Rescue Liaison Officer
Coast Guard Box #1, Navy 48
c/o Fleet Postmaster
San Francisco, Calif.

CONTENTS

Communications to Air Sea Rescue Bulletin should be addressed:
Air Sea Rescue Bulletin
Air Sea Rescue Agency
1516 Fourteenth Street NW.
Washington, D. C.

METHODS FOR LOCATING SURVIVORS ADRIFT AT SEA ON RUBBER RAFTS

★ ★ ★ ★ ★

eport on Search Procedures, Search Areas, and Modification of Areas With Passage of Time

'ollowing report, "Methods For g Survivors Adrift at Sea on Rafts," recently has been issued 235 by the Hydrographic Office Jnited States Navy Department,)rinted here with permission of ce. It is based upon data col- nd compiled for the Bureau of he Bureau of Aeronautics, and lrographic Office by the Woods eanographic Institution and the Institution of Oceanography of /ersity of California.

INTRODUCTION

report deals with search proce- earch areas, and the modifica- these areas with the passage of ı an earlier report,[1] the course drift was predicted by the sim- actical procedure for personnel s; in the present report, this is elaborated to include all in-)n available at this time on the f winds and currents on raft

HING POSITION OR AREA

itching position or area will fall of three categories: (1) Ditch- ition based on an accurate fix, ching position based on dead ıg from a previous accurate fix, ditching area estimated from)wn position when neither the position nor the time of ditch- nown.

the reported ditching position l on a navigational fix or a fix l by DF or other current navi- aid, the probable error in posi- y be 10 miles in any direction. ıis error must be combined the navigational error of the searching aircraft. In general, the combined navigational error will be 1.4 times that of either aircraft alone, or 14 miles if the ditched and search planes have flown equal distances.

When the reported ditching position is based on dead reckoning, the probable error of the ditching position is assumed to be 5 percent of the distance flown from base or from land.

When the ditching position and time are not known, the probable ditching area is estimated from the last known position, and is centered along the proposed track of the plane. The area becomes progressively wider away from this previous fix; at any point the probable error of position can be taken as 5 percent of the distance from base or last known position.

SEARCH AND CONTACT

When the ditching position can be estimated, the search area is centered on the probable position at the time of search and its radius is based upon the probable error of that position. The searching aircraft should at first cover a radius which is only slightly greater than the probable error of position. If no contact is made, the search should be repeated if possible, using a larger search radius. If a third search is necessary, a still larger area should be covered, and so on. The search area should be completely covered on each search. The search radius for each succeeding search is shown in plate I (p. 23). If the proper sweep spacing is used, the probability of contact for one search is 23 percent, for two searches 47 percent, for three searches 66 percent, for four searches 79 percent, and for five searches 87 percent. When the ditching position is unknown, the search area is determined by calculating separate search areas at intervals along the probable track of the plane and drawing tangents to these areas. (See example 4.)

SEARCH PROCEDURE

Search procedure will necessarily depend upon (1) the number of planes or ships available for search, (2) the distance of reported ditching position from base, (3) the uncertainty of the ditching position, and (4) the time interval between ditching and the start of search.

When the approximate ditching position is known and the search area is not elongated, search should follow an expanding square course around the center of the search area.

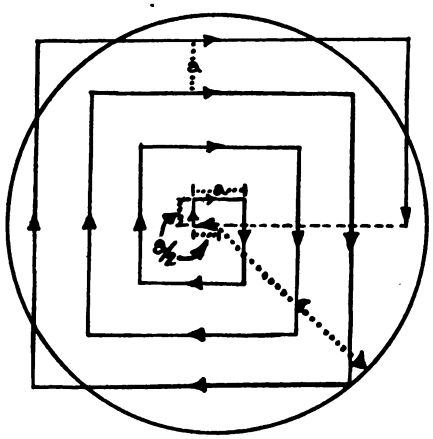


FIGURE 1.—Expanding square search pattern: (*a*) Sweep spacing; (*r*) search radius.

When the ditching position is not known and the search area is therefore elongated, parallel track search should be used.

If both planes and surface vessels are available, the search plan shown in figure 2 should be used; the surface craft should proceed along the axis of the search area and direct the planes flying across the area.

When depending on sight and sufficient searching planes are available, planes should fly at 800 to 1,000 feet and should use a visibility of three-fourths mile; that is, the distance between

Use of Cloth Survival Charts in the on of Rubber Rafts, OPNAV–16–V)th) and OPNAV–16–V S111 (paper), 4; distributed by Air Intelligence)P–16–V, Division of Naval Intel- Office of the Chief of Naval Opera- vy Department, Washington, D. C.

searching planes (or courses of a single plane on successive sweeps) should not exceed 1½ miles. At night, visibility may be increased to 3 miles (distance between searching planes 6 miles) if the raft has flares or lights. If the raft is equipped with a radar corner reflector, planes can fly at altitudes up to 2,000 feet and the "visibility" may be increased to 4 or 8 miles (distance between searching planes 8 to 16 miles). The sweep spacing (a) is twice the visibility

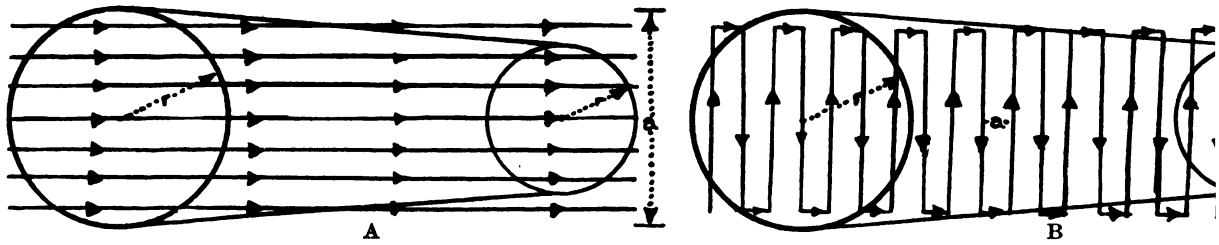


FIGURE 2.—Parallel track search patterns: (A) Search pattern when several planes are available and raft is equipped with r reflector; (B) search pattern when few planes are available; (a) sweep spacing; (r) search radius.

multiplied by the number of searching planes.

Since a search radius (r) of 27 miles will require a flight of about 2,000 miles if the sweep spacing (a) is 1½ miles, it is apparent that a number of planes will usually be required to cover the area adequately.

If the search lasts for more than a few hours, the shifting of the search area caused by current and wind drift should be taken into account. If the search is long continued, careful records should be kept of the area searched each day, but it should be remembered that a shift in wind direction may cause a raft to drift into an area which has been thoroughly covered previously.

If an empty raft is sighted by a searching plane or ship, and the wind has not shifted direction, loaded rafts with survivors may be found upwind.

WIND, CURRENT AND DRIFT

Rubber rafts are carried along by the current and pushed by the wind, so that the direction and speed of raft drift are usually dependent upon the resultant of these two forces.

When there is a current but no wind, a raft will drift in the direction of the current and at the same speed whether or not a sea anchor, or drogue, is used.

If there is no current but a wind is blowing, a raft will drift approximately downwind. For a loaded raft without a drogue, the drift speed through the water will vary from about 1 knot with a 20-knot wind (Beaufort force 5) to about ½ knot with a 4-knot breeze (Beaufort force 2). If a drogue is used, the speed of raft drift due to wind alone will be reduced to less than 3 percent of the wind speed. (See plate II, p. 25.) In general, aircraft personnel may be instructed to use a drogue for about 48 hours after ditching and then to attempt to make their way toward a friendly coast, but this will depend on the proximity of the ditching position to friendly or enemy held coasts as well as on the winds and currents, so that briefing instructions will need to be adjusted to conditions peculiar to each flight.

USE OF SURVIVAL CHARTS

The streamlines on the survival charts show the resultant current near the surface, based upon ships' observations compiled by 1° squares. The direction toward which the current flows is indicated by the arrows on the streamlines, and the resultant velocity in nautical miles per day is indicated by the numbers. The steadiness of the current, or the percentage of the time that the current flows in the average direction, is shown by the heaviness of the streamlines.

The shaded arrows on the charts give the resultant direction toward which the wind blows in each 5° square, and the numbers show the resultant Beaufort force of the wind.

The average currents given on the chart correspond to the resultant winds shown by the shaded arrows. If the local wind at the time and place of ditching has been blowing for several hours in a different direction or at a different speed from that shown by the nearest wind arrow, the actual current will be a combination of that shown on the chart with the current set up by the wind. The current shown on the chart will be predominant when the steadiness is more than 75 percent and the velocity is more than 24 nautical miles a day. On the other h the streamlines show a ste less than 25 percent, the cur on the chart has little s and the actual current will entirely due to the local wi

Currents near shore will v fer in speed and direction shown or calculated for of ters. Near shore the curre always flow parallel to the b are mainly tidal and fluctua and often reverse direction 12 hours. Therefore, the d the tidal current is usually over a 24-hour period.

DETERMINATION OF C

The following rules shou in determining the course of during the first 24 hours follo ing:

1. From the ditching posit a vector in the direction of age current shown on the sur Make the length of this vec tional to the velocity of the miles per day. Some judgme used in determining the dir velocity of the current. I most weight should be giv streamlines indicating the steadiness in a particular a will usually be necessary t the velocity by interpolatin two or more velocity figure ditching position.

2. Determine the wind dir velocity at the ditching posi wind) during the previous If there are ships or planes proximate area, they should wind every 6 hours if possible four reports should be avera tain the wind direction an for that day. It should be r that the wind at the sea su differ from that aloft. Pla estimate the wind direction b

(Continued on page 1

LANDPLANE DITCHING

Part II

Factors Which Determine Ditching Characteristics

e No. 4 Issue of the AIR SEA BULLETIN the first section of ndplane Ditching Staff Instruc- nual," prepared by the Air Sea Agency Committee to Study ; Procedures, presents the prob- ditching as approached by the an aircraft forced to ditch his The factors influencing his de- ı selecting a landing approach, condition of the wind and sea, conditions, visibility, and power e, serve as a basis for the de- tion of a prescribed ditching ıe.

econd section, primarily of in- › personnel concerned with the tion of ditching bills and those ed in the design of aircraft, ith the ditching characteristics aft influencing the selection of stations.

ıird section, "Ditching Safety in rt Landplanes," of the LAND- ITCHING MANUAL will appear in t issue of the AIR SEA RESCUE N.

IONEER RESEARCH

the past few years it has been to obtain a wealth of informa- m the Americans and British ng the behavior of landplanes r landings by interviewing sur- ınd in some cases Technical and ɔnal interviewing officers have le to inspect the salvaged craft itched crews. Aircraft have ac- een experimentally ditched. In avor to gain further informa- ale models have been ditched s times, and static drop tests of le aircraft have been made. more, with the knowledge of ngth potentialities of the air- relation to ditching, measures en taken in some instances to en the weak areas of the air- o increase the size and number to provide ditching belts, and ll flotation gear. In all opera- aircraft a ditching drill has ıwn up in relation to the ditch- ing characteristics, exits, and available ditching stations in the aircraft.

The following discussion attempts to show the conclusions at which we have arrived and how the drills take their present form. Typical fighters and bombers, both American and British, are discussed.

It must be realized that at present the subject of ditching is surrounded with conflicting theories, chiefly due to a lack of knowledge concerning the problem. The operational pilot would be well advised to become acquainted with the complete situation before making changes in his anticipated ditching technique. He must remember that present methods are based on the evidence of operations and experimental ditchings plus common sense. It would not be right to assume that because one crew escaped death when they ditched at 150 m. p. h. in certain sea conditions that that is the correct procedure. Cumulative evidence is the evidence that counts!

It should be borne in mind that the landplane is a poor weak thing when pitted against the ocean's might. Remember, also, that the seaplane must treat the sea with deference or disaster is inevitable. This is true of any surface craft however large, though to a less extent. In landplane ditching, the need for low horizontal and vertical speeds and the best attitude of impact is stressed. Thus, the adoption of such a technique is the best compromise between good handling qualities and letting the aircraft down onto the water as gently as possible in the correct direction.

GENERAL CHARACTERISTICS

The main factors governing the ditching and flotation characteristics of a landplane are twofold—those which are under the control of the pilot and those which concern the designer. If the pilot can achieve the following essentials for ditching he has, in the event of having to ditch, the best chance of being a good customer of the Air Sea Rescue Service:

1. Low forward speed.
2. Low vertical impact speed.
3. Primary impact aft of the center of gravity.
4. Choice of approach along the smoothest path of broken water.

The strength and shape of the fuselage, and the strength and shape of the wing are the factors of primary concern to the aircraft designer and ditching drill instructor. The factors involved include:

Strength of fuselage.

1. Main structure and skin.
2. Bombardier's window and nose.
3. Escape hatches, both lower and upper.
4. Bomb doors.
5. Strength of bomb bay roof and bulkheads.
6. Wheel doors, particularly nose wheel doors.
7. Turrets and their hatches.

Shape of fuselage.

1. Size.
2. Length of nose and tail.
3. Contour.
4. Depth and position of bomb bay in relation to center section.
5. Position of turrets, radiators, and intakes.

Strength of wing.

1. Main structure and skin.
2. Wheel doors.
3. Flaps (in special instances).
4. Watertight integrity.

Shape of wing.

1. Size.
2. Height in relation to fuselage.
3. Dihedral.
4. Position of engine nacelles.
5. Radiators and air intakes.

SINGLE-ENGINED FIGHTERS

Advantages

1. In general the fuselage of the fighter is strong and the pilot is not normally situated close to the nose. Violent water in-rush is not so likely

to occur through the lower portions of the fuselage.

2. On all fighters the flaps are relatively weak and will collapse on impact.

3. Several U. S. Fleet fighters have a low stalling speed which is an advantage and which allows ditching to be more safely executed. In general such aircraft do not have low protrusions because they are aircooled.

Disadvantages

1. In general the smaller the aircraft the less chance it has of ditching successfully in any given sea condition, other than small seas.

2. Fighters with a high performance have small wings relative to aircraft size; since the wing is the main contribution to buoyancy, this is a disadvantage.

3. The wing of a high performance fighter is thin and sometimes situated low relative to the fuselage. In ditching, pitching is almost inevitable and when this occurs the wing becomes a negative hydro-foil, particularly if it is set low on the fuselage. Some American single-engined fighters have radiators situated beneath the fuselage, which is a primary cause of pitching.

4. High performance fighters with their high wing loading have a relatively high stalling speed which entails a high impact speed.

5. The cockpit of fighter aircraft usually abounds in equipment such as the gun sight from which the pilot is likely to receive injury, particularly in the absence of some type of shoulder harness.

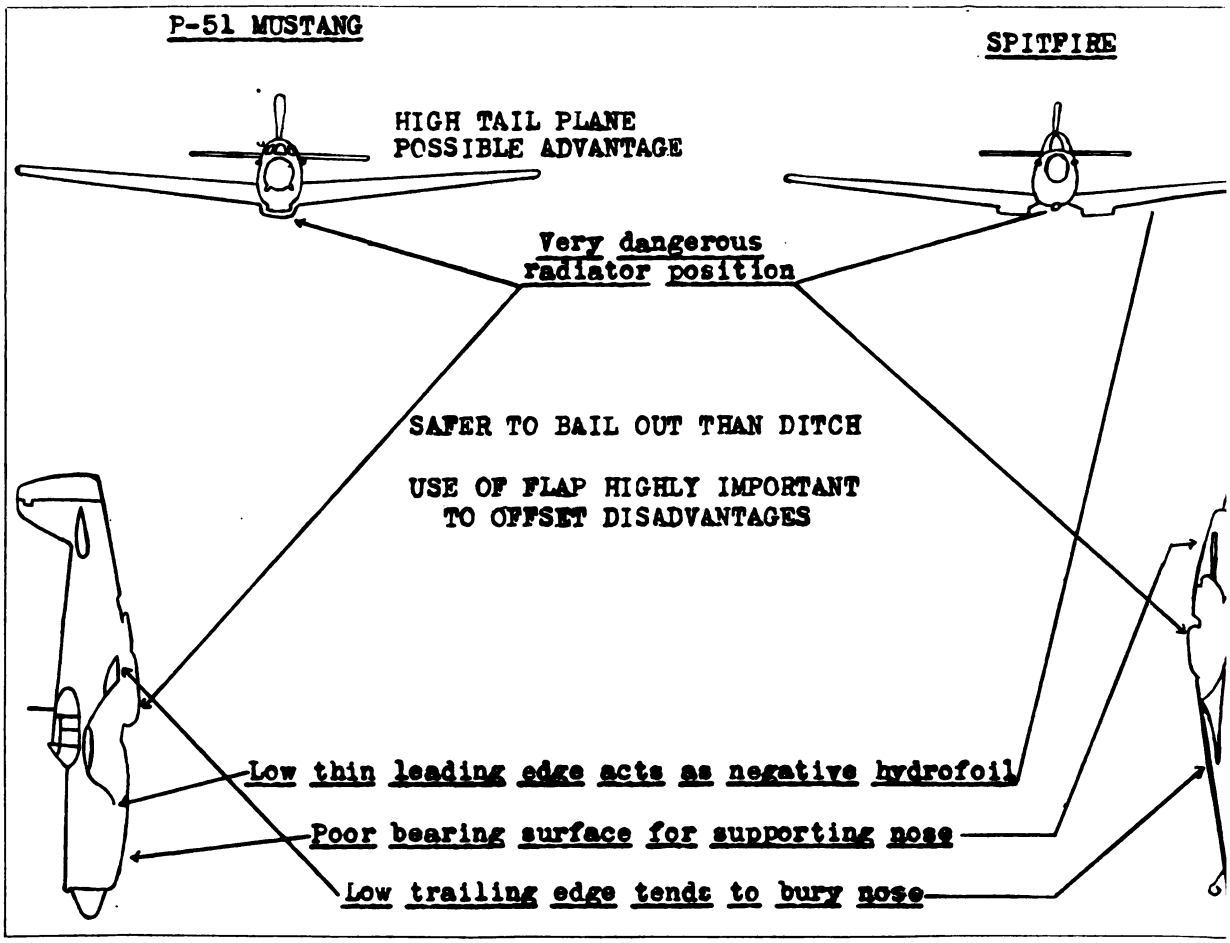
6. Since such aircraft have only one engine, failure immediately commits the pilot to ditching or to bailing out, which may not necessarily be the case in a multi-engined aircraft.

Ditch or Bail Ou

Because most Army Air Fo engined fighters are bad ditcl struction to their pilots is to preference to ditching. Tt tion does not preclude the committing himself to ditcl attempt to reach a ship, a s leave an enemy area. The I struction is similar. The 1 prefers to ditch its fighters b are able to achieve a rela ground speed of impact. I are also better acquainted conditions and, thus, better ditching technique. Since su have better ditching characte preference does not seem to the U. S. Army or the R. A point.

Possible Improvements i

1. Radiators should be sit forward in the nose or poss



ding edge, as in the Mosquito.
ntain the most favorable hydro-
shape and strength of the air-
ıd skin compatible with opera-
quirements.
vision of large upper hatches,
ttisonable.
vision of a seat which is so ar-
:hat a parachute and pararaft
'orn comfortably.
'ision of a clean cockpit with as
rusions as possible.
tallation of an improved har-

ure the seat to withstand high
tions.

TI-ENGINED BOMBERS

utstanding features of a multi-
bomber which lend to its ad-
)us ditching characteristics are:
t the larger the aircraft, the
he ditcher, with some excep-
2) it usually has weak flaps in
to the water loadings; (3) with
ceptions more ditching stations
lable because of the size of the
; and (4) a large scale emer-
]uipment may be carried in life
wages.
ıain disadvantages of bombers
.k bomb bay doors, weak nose
ıin wheel doors, weak lower
ıatches, and hydrodynamically,
)se and tail structure.

ıtages Versus Disadvantages

the wing is set low, it shares
act loadings with the fuselage;
ıce the wing is the main contri-
o buoyancy, it supports the air-
such a position that the fuse-
ıot so liable to instant flooding.
)o is true of a low wing setting
he wing section is thick although
:ion may be increased. If the
as positive dihedral, the wing
y to some extent be relieved of
act loadings. If on a mid-wing
, the engine nacelles protrude be-
: wing surface, they will also
ıe impact loadings with the wing
elage although this also may in-
etardation.
e the wing is provided with bulk-
's watertight integrity will main-
oyancy which is naturally im-
by the presence of empty fuel

'rsely, where the wing is set
e fuselage is called upon to bear the brunt of the primary impact loadings and sinks deeply before the wing buoyancy takes effect. Furthermore, a high wing aircraft is liable to be unstable laterally on the water which will cause the aircraft to roll over sideways during ditching, particularly if the landing has been made crosswind. This disadvantage may to some extent be offset by low underslung engines which, although not providing buoyancy, may give an upward lift to the wing during the early stages of ditching, particularly if the engines do not have low radiators and air intakes.

Fuselage.

The stronger the bomb bay doors, the better. It may not be possible, compatible with operational requirements, to construct bomb bay doors of sufficient strength to completely resist collapse in normal ditchings. However, the very fact that they provide some resistance to water loadings will improve the ditching characteristics.

The main disadvantage in the design of the fuselage of bombers can be attributed to the presence of bomb bay doors. When the aircraft strikes the water, they can generally be expected to collapse and allow the water to gain rapid entry to the fuselage. If the bomb bay extends deeply upward into the fuselage, the water in-rush has easier access to other portions of the aircraft. thus hastening flooding.

Bomb Bays.

All present British manufactured aircraft have shallow bomb bays with a robust bomb cell roof. Thus, the combined strength of t e bomb doors and bomb cell roof are superior in water resisting characteristics to the American form of deep bomb cell. If the aft bomb cell bulkhead slopes from forward to aft, it is better able to deflect the water in-rush from gaining further entry providing it is sufficiently strong.

In several aircraft, the aft bomb bay bulkhead is in a relatively weak region; that is to say, aft of the trailing edge where a mid upper or lower turret may also be present, further weakening this area. When water gains entry via the bomb doors, it meets the aft bomb bay bulkhead and is liable to initate break-up in that region which is assisted by tail impact loadings. Furthermore, when the aircraft pitches forward, inertia loadings are set up resulting from the turning moment about the pivoting point. A combination of these factors will often bring about complete fuselage fracture aft of the wing trailing edge, allowing the remainder of the fuselage to float in a very steep nose-down attitude, thus decreasing flotation time and complicating egress of the crew and launching of the life rafts.

Fuselage Shape.

The position of bomb bays is important. As in the case of the B–17 Flying Fortress, the aft bomb bay bulkhead is well forward of the trailing edge. Although complete fracture of the fuselage has occurred in Fortress ditchings, available evidence shows that it occurs more frequently in Liberator, Halifax, and Lancaster ditchings in which the rear bomb bay bulkhead is aft of the trailing edge. This would seem to be due to the fact that although in the Fortress the water gains entry by the bomb doors, it does so in a strong part of the airframe. This good characteristic may be further improved by the fact that the tail is fine, having less tendency to impose severe impact loadings near that point just aft of the trailing edge.

In contrast to the Hudson, the Lancaster, and to a less extent the Fortress, have long noses. Providing the long nose is well shaped hydrodynamically, it will have a planing effect, thus resisting pitching. However, the resistance to pitching imposes high loadings on the nose, which will usually cause the nose wheel doors, the bombadier's window, and lower hatches to burst inward. Where loadings are very high complete collapse of the nose will result. Where water gains entry it will initiate local break-up and increase retardation. These loadings coupled with the resistance to pitching, may sever the nose from the fuselage.

There is not a great deal of evidence to show what effect height of horizontal stabilizers and rear fuselage shape have upon ditching characteristics, but British reports indicate that a tail having little upward sweep and being flat in plan view may cause pitching when the tail strikes. Certain rear fuselage shapes may cause the tail to be sucked down on impact, as occurred in a full scale Liberator test.

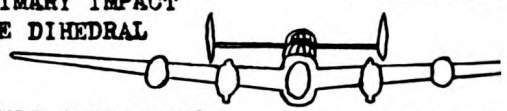
If the under surface of the fuselage is curved with a short nose as in the Hud-

(Continued on page 8)

B-17 FLYING FORTRESS

OUTER WING SECTIONS MAY BE EXCLUDED FROM PRIMARY IMPACT DUE TO POSITIVE DIHEDRAL

HALIFAX



CLEAN UNDER SURFACES, except for turret

LOW BUT THICK WING SHARES IMPACT WITH LITTLE NEG. HYDROFOIL ACTION but increases retardation

MID THICK WING SHARES IMPACT POSSIBLY WITHOUT NEG. HYDROFOIL ACTION but wing thickness and low nacelles increase retardation, POSSIBLY GIVE SOME UPWARD SUPPORT.

CLEAN UNDER SU

POINTED TAIL
LESS TENDENCY TO BOUNCE UPWARD

Possibly medium low tail plane offsets this advantage

Mid under turret possible disadvantage

NOT A VERY LOW TRAILING EDGE
LESS TENDENCY TO BURY NOSE

Lack of bomb cell roof provides no further resistance to water entry

LOW BOMB BAY ROOF SHARES RESISTANCE TO WATER INRUSH WITH BOMB DOORS

High trailing edge less tendency to bury nose

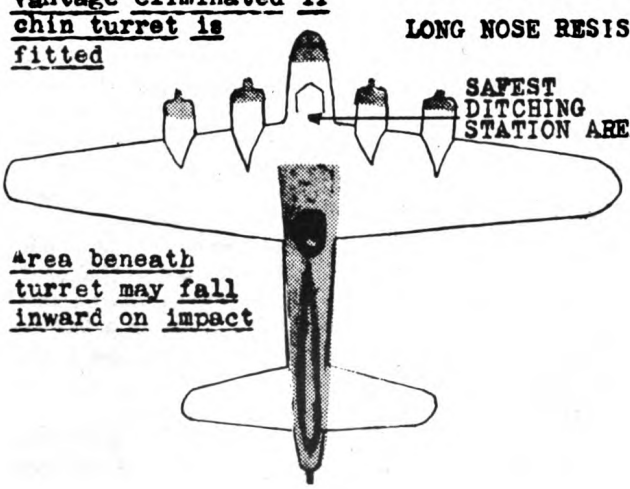
HIGH TAIL PLANE
LESS TENDENCY TO BOUNCE UPWARD

Flat tail
greater ten
to bounce u

ROUND LONG UPSWEPT NOSE
A REMOTE APPROACH TO FLYING BOAT BOW but advantage eliminated if chin turret is fitted

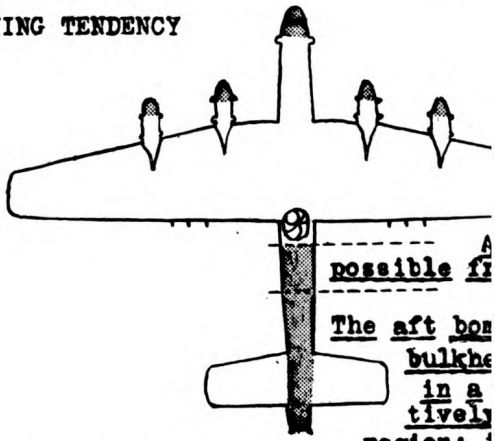
BUOYANCY OF LOW WING SUPPORTS FUSELAGE THUS FACILITATING ESCAPE

LONG NOSE RESISTS DIVING TENDENCY



SAFEST DITCHING STATION AREA

Area beneath turret may fall inward on impact



possible fr

The aft bo
bulkhe
in a
tively
region; i

usually collapsed by water inrush,
initiates breakup in that region as
by tail impact loadings and inertia lo
resulting from the turning moment abo
pivoting point. This occurs when th
strikes and the tail

DENTING OF PLATES RELIEVES LOADINGS but fracture of plates increases retardation and may lead to general local breakup.

Key: Water inrush ■
FAVORABLE
Unfavorable

IDPLANE DITCHING, PART II

(*Continued from page 6*)

ill be unstable fore and aft in

Stations.

litching stations are available wing spars which run through age when above the bomb bay. ls are also good stations, pro- ney are not too weak and are rom water in-rush.

ft having pressurized cabins ly to possess good fuselage tegrity, but movement of the l provision of exits may be re- to a more or less extent accord- esign.

craft which are so constructed ew members cannot speedily om one end to the other (in 0 the navigator is completely from the rest of the aircraft) ng up of safe ditching stations ed or made completely impos- some members of the crew. upper turrets are situated ie flight deck or in the region ng stations, they may prejudice ty of the crewmen due to the t they may collapse inward on (Steps are being taken, how- strengthen the supporting e of such turrets.)

Exits.

heavy bombers, it is possible to adequate exits on the basis of e exit for every three members rew. This desirable situation met in British heavy bombers, ot the case in their American arts; although steps are being meet this requirement.

ching Stations To Offset Disadvantages

deciding upon ditching stations, owing parts of the airframe be given consideration: The t, the weakest and most likely off on impact, the most remote ere water in-rush, and the near- vailable upper exits.

trongest part of the airframe is gion of the center section.

eakest parts are the rear end of lage aft of the trailing edge ay completely break free, and nust therefore be excluded as on for ditching stations when

(*Continued on p. 9*)

Messages on Waterproof Cards Employed by Rescue Squadron 3

Two ideas for facilitating rescue have been suggested recently by Rescue Squadron Three, U. S. Pacific Fleet.

One is a waterproof card 3 by 4¾ inches attached to a 4- or 5-yard lanyard which is secured to a droppable raft. On it are printed the following instructions:

> "Before Pulling Handle Place Loop as Shown (Over Shoulder, Around the Back and Under the Other Arm). This Lashes You to Raft. THEN PULL HANDLE."

This idea was developed as a result of experience with survivors in water who released the CO_2 inflation gear, and then allowed the raft to drift away before they could pull themselves aboard.

MESSAGE CARDS

The other idea has resulted in the printing on waterproof material two message cards 10 by 12½ inches to be dropped to survivors on a raft. One card gives prepared detailed instructions, and the other is for supplemental instructions. The instruction card is reproduced here as follows:

UNITED STATES PACIFIC FLEET AIR FORCE

RESCUE SQUADRON THREE

IMPORTANT

YOU HAVE BEEN SIGHTED BY RESCUE SQUADRON THREE. FOLLOW THESE INSTRUCTIONS AND YOUR RESCUE WILL BE EXPEDITED THROUGH YOUR COOPERATION.

1. MAINTAIN IDENTIFICATION: If you will train dye markers, show smoke, use mirror, it will enable rescue craft to keep track of your position.

2. SIGNAL IF INJURED BADLY: By crossing arms across body. If uninjured, hold arms straight out at side. Rescue plane will acknowledge by dipping wings.

3. DO NOT USE EMERGENCY EQUIPMENT NOT REQUIRED: It may not be possible to pick you up at once so conserve your gear, particularly pyrotechnics, which are of little value by day.

4. PLAN FOR RESCUE:

You will be picked up by:

CIRCLE ONE: This Airplane. Submarine. Seaplane. Surface Craft.

In approximately _____ (Minutes) (Hours). Approximate Bearing _____. Detailed instructions regarding cooperation expected of you for each type of rescue following. In each type of rescue remember: REMOVE HELMET AS RESCUE CRAFT APPROACHES AND SECURE ALL FIREARMS.

RESCUE

1. FLYING BOAT.

A. Favorable Sea.

1. Airplane will land; remember it is hard to keep you in sight when plane is on the water so CONTINUE TO SIGNAL by mirror or smoke.

2. STAY CLEAR OF PROPELLERS as a swell may wash you into them. It is recommended that you remain outboard of the wing tip floats. If one of the engines is cut, approach the plane between the wing tip float and the hull on the side of the cut engine.

3. A life preserver with a line will be thrown to you, or if you are incapacitated a man in a life raft with a line attached will guide you to the plane.

B. Unfavorable Sea.

1. This plane will report your position and arrange for you to be picked up by a submarine or surface craft.

2. This plane will drop provisions as required for your rescue. The equipment or supplies dropped will depend on the circumstances. Most of this equipment will be dropped with lines having floats to assist you in recovery. Check out in the use of all of your equipment.

3. Rescue Squadron THREE will stand by as necessary to direct your rescue by leading pick up craft to your position.

2. SEAPLANE (Cruiser or Battleship type).
   A. CONTINUE TO SIGNAL when plane is on water.
   B. If EXHAUSTED, swim or paddle outboard of wing tip float if forward of wing as swell may wash you into propellers. Crew will try to get you to the main float. DO NOT HOLD ONTO WING TIP FLOAT—DANGER OF CAPSIZING PLANE.
   C. If capable, swim or paddle to main float aft of wing.
   D. Plane may or may not have two-man crew. If only pilot aboard, you must be prepared to get into plane with little help.
   E. DO NOT ATTEMPT TO CLIMB FROM FLOATS TO WING UNTIL pilot or radioman instructs you or you may capsize plane. Crew will give you verbal or hand signals.
   F. If seaplane is equipped with small life preserver and line, crew will show this so stand by for line throw.

3. SUBMARINE (Day).
   1. CONTINUE TO SIGNAL preferably with mirror or smoke. Also dye marker can be seen.
   2. If SUBMARINE SURFACES look for life preserver and line to be thrown.
   3. If PERISCOPE TOW is desirable due to proximity of shore batteries.
      (a) Submarine will make pass at raft with periscope showing.
      (b) Have line ready to throw around periscope (remember if you miss on first pass, submarine cannot reverse course submerged and must make another circle). Best tow length 20 feet aft.
      (c) Do not secure line to periscope and raft unless it can be slipped quickly in case submarine dives.
      (d) Maintain surface and aircraft watch for submarine and signal to periscope if unfriendly aircraft or surface craft in vicinity.
      (e) Submarine will tow until safe to surface; MAINTAIN CONTACT THROUGH PERISCOPE.

   SUBMARINE (Night).
   1. WATCH for flares from submarine, answer them with flares, flashlight; LISTEN for whistle, answer with whistle, flares, or flashlight.
   2. SHIELD FLASHLIGHT to maintain contact with approaching submarines without giving away operation to enemy.

4. SURFACE SHIP.
   A. DAY: Best signal is smoke, then mirror, then dye marker.
   B. NIGHT: Best, signal flares, then flashlight

616848—44——2

LANDPLANE DITCHING, PART II

(*Continued from p. 8*)

possible. An exception to this may be where a pressurized compartment exists in the rear end. The *nose forward* of the *wing leading edge* is likely to be quickly flooded and may possibly break off.

Remoteness from water in-rush. This consideration excludes the nose region and any portion aft of the rear bomb bay bulkhead. On British shallow bomb bay aircraft, the most remote position is in the center section region. In American heavy bombers, the flight deck and the area above the bomb bay (Liberator) appear as the best choice. The Liberator flight deck is less safe than the deck above the bomb bay, provided an upper exit is present.

Nearness to available upper exits is an important consideration. It is vitally important that the crew should be braced against the impact, and the pilot must always be strapped in with shoulder harness. There are five forms of recommended ditching stations:

1. In a sitting position, back and head braced against a solid structure, such as at the rear of the wing spar, a well secured armored door, or bulkhead. If the head comes above the spar which is being used as a ditching station, it is very important that the head should be clasped in the hands with fingers firmly interlocked to avoid injury.

The second card is marke
for writing in additional d

2. In some aircraft, in
British Liberator and ce
transports, provision of
ditching belts secured acro
lage to strong members of
have been provided. Th
adopt the same attitude
strap as mentioned in para

3. Providing there is ava
the body is laid upon the sid
aircraft with the back aga
and the head clasped in the

4. A less satisfactory ditc
is to lie on the floor with the
rear and the feet braced ag
structure. It is necessary
knees bent to avoid injur
possible. The limiting fa
ditching station is the liat
legs to fracture.

5. A compromise ditchin
assumed as follows: one ma
tion as in paragraph 1, but
drawn well up. The secon
takes station with his back
forward man's legs, clasping
his hands. A cushion betw
is advantageous.

Possible Improvements

NOTE.—Water loadings a
that airframes are not like
signed with strength sufficie
collapse. The main objects
deflect water loadings by m
favorable external shape, an
off bulkheads and wheel ho
keeping general strength as
compatible with operation
ments, ditching characteris
further improved.

1. Maintain the most favo
dynamic shape and strength
frame compatible with ope
quirements.

2. Wherever possible, fro
ing and crash viewpoint, the
be set in a low or mid posit
to the fuselage.

3. Avoid underslung radi

4. Provide manually an
cally opened life raft stowa
of holding *all* rescue emerge
cured to the floor of the raft

5. Provide ditching straps
quate ditching stations are
able.

(*Continued on p. 12*

A Part of Navy's Survival Training for Aviators

THE WATER SURVIVAL PHASE

ing ability is vital for sur- is a life-insurance policy that lends in an emergency. Skill g one's self in a water disaster d to be a military require- peacetime it is regarded as a , a physical conditioner, a petitive sport, and a social However, during war the pilot escape through burning oil tressed carrier, drop from his into the water and inflate his when injured, extricate him- the cockpit of his sinking m through heavy seas to res- nded mate, administer arti- piration to the apparently or perform a combination of s, is using a technique equally ant as his ability to fly his ombat.

t reason the Navy demands flier be a well-trained swim- at during an emergency over can perform his skills auto- under the most adverse con- Vartime aquatics involve in- for the future needs of men be forced to abandon ship, have to crash land or para- water, and individuals who wamp and river regions or hrough treacherous surf to shore. When a Naval Avia- receives his Wings, he has wimming examination which t he can swim 880 yards in g, perform a life-saving carry ds, and demonstrate in deep releases from the front and holds.

T. Ward, former Director of Training, says *"Sports are raining device in the physical rogram for Naval Aviation athematics and physics are academic courses and ord- gunnery are employed in the ucation for cadets. Physical as made an integral part of g plan and is continued pro- throughout the entier train- ition cadets."* The program ion for Naval pilots, like the Sea Survival Training dis- cussed in the No. 4 Issue of the AIR SEA RESCUE BULLETIN, is started in the early phases of cadet training. Swimming ability is not a prerequisite for application and acceptance as a prospective Navy pilot. Therefore, some 25 percent of the men entering Naval Aviation cannot swim at all, while others merely need to develop their endurance, and adjust the basic swimming technique to wartime requirements. Navy men who were not able to stay afloat in water even for 5 minutes when entering the program have been known to pass the test required for pilots after 12 weeks of instruction and practice.

Progressive Program

The basic and elementary instruction starts in the Pre-Flight School, and as the cadet moves from one station to the next, the swimming program includes skills progressively more difficult. The minimum requirements of the men are measured by tests to determine the extent to which the skills have been mastered and to check the efficiency of the instruction. During or upon completion of the various phases of the Naval Aviation Program, the cadet must have achieved the following minimum requirements:

Pre-Flight Schools

C, D, B, and A Tests required.

"D" Test: Float, tread or swim for 5 minutes.

"C" Test: Swim continuously for 80 yards, demonstrating correct form in the elementary back breast, side and overhand strokes. Each stroke is performed for 20 yards.

"B" Test:

1. Swim continuously for 200 yards, using the breast, side, elementary back and over- arm strokes. Time limit 5 minutes, 20 seconds.
2. Perform a tired swimmer carry for 60 feet.
3. From a surface dive, swim 20 feet underwater.

"A" Test:

1. Tow a person of own approxi- mate weight by any carry, except tired swimmer carry, for a distance of 60 feet.
2. From surface dive, swim under water for a distance of 60 feet.
3. Demonstrate correct perform- ance of the prone pressure method of artificial respira- tion.
4. Jump into the pool from 10 feet height, swim for 50 yards, wearing shirt and trousers.
5. Swim continuously for one-half mile, using any stroke or combination of strokes. If pool arrangements make the distance swim impractical, 40 minutes of continuous swimming may be substi- tuted.

Primary Training Stations

AA Test required.

"AA" Test:

1. Swim 880 yards, wearing shirt and trousers.
2. Perform a life-saving carry for 100 yards.
3. Demonstrate in deep water, the releases from the front and back neck holds.

Intermediate Training Centers

AAA Test required.

"AAA" Test:

1. Swim 1 mile.
2. Tow or push a person who is on an improvised float for 220 yards.

Operational Training and Fleet Tests

Maintenance test required once every 2 months.

Maintenance Test: Swim 440 yards in 15 minutes.

The instruction in all phases of the program is carried out by a combination of lecture, demonstration, and actual participation, with emphasis upon the practice element of the training. Visual aids, such as motion pictures, film strips, and photographs are used wherever applicable.

Cadets are assigned to classes according to their ability, such as basic or

advanced, or beginners and qualified. A second method of assignment may divide the men into three groups: namely, nonswimmer, intermediate, and advanced. The more advanced swimmers may be able to devote a portion of their scheduled time to water sports and competitive swimming, while the less experienced swimmers learn the basic strokes and develop their aquatic skill.

The standards of achievement set up for each phase of the Naval Aviation Program are merely a guide for measuring the development of the swimmers' ability and endurance. Check-out tests determine more specifically the survival and life-saving techniques they have acquired during the instructional periods.

Pre-Flight Training

In the Pre-Flight Phase of Water Survival the cadet learns largely the techniques involved in abandoning ship. Tests simulate battle conditions as much as possible. By the time a cadet has completed his training in this stage, he will be able to perform proficiently all the basic swimming strokes, swim fully clothed, rescue a drowning victim, and assist a tired swimmer to safety. Water safety instructions include the famed "Shirt Tail Flotation" techniques, or clothing skills. In the event of an emergency a pilot may find himself adrift sans the support of life jacket, rubber raft, or other buoyant equipment. Training emphasizes that every man who is clothed is also equipped with material for making his own life preserver. Almost any article of clothing can be used, and pillow slips, mattress covers, helmets, sea bags, bed sheets also may serve as emergency support. The idea is to capture an air pocket or bubble which will surprisingly enough provide buoyancy for several hours' flotation.

There are several methods designed to use the shirt for flotation. One is to jump into the water with the shirt tail held away from the body so that it will fill with air during the descent. Neck and sleeves must be closed. Another is for the swimmer already in the water. He may tuck the outside of his collar in, fasten all buttons, and then tuck his shirt tails into his trousers leaving room for an air pocket. Next he takes a deep breath, bends forward and by blowing into the two front buttons creates an air bubble across his shoulders that will keep him afloat. Thirdly, the cadet may remove his shirt and put it on backwards. Both hands grasp the tail of the shirt, lift it above the water and quickly draw it down to catch a pocket of air. The trainee must then lean back into a floating position quickly to prevent the air from leaking out by the way of the collar. There are other means of using the shirt for inflation—some more complicated and others less detailed.

Trousers may also be inflated in a variety of ways. Perhaps the most common is, after carefully removing the trousers, to secure all buttons and tie a single knot in the end of each trouser leg. The swimmer then inserts his hands inside the waist with palms turned inward. Air is trapped by drawing the trouser waist down on the water surface. He can also blow them up orally under water or simply fill them with air by cupping his hand and pumping in air bubbles. There are others, and the pilot must be able to inflate his shirt and trousers both in two ways before he can "check-out."

Floating debris will also provide welcome support. The secret lies in the fact that only a minimum of pressure may be put upon it.

Instruction at Primary

The checkout tests of survival techniques listed below for the Primary Phase of the program illustrate how the pilot progresses.

Checkout No. 1. Swim under water 25 feet, wearing shirt and trousers.

Checkout No. 2. One-quarter mile swim.

Checkout No. 3. Demonstrate methods of treading water for 5 minutes (hands alone 1 minute, feet alone 1 minute, hands and feet 3 minutes).

Checkout No. 4. Demonstrate fireman and saddle back carries.

Checkout No. 5. Demonstrate methods of separating two people.

Checkout No. 6. Board a rubber boat; help another person aboard.

Checkout No. 7. Swim 50 yards wearing a life jacket.

Checkout No. 8. Climb and descend cargo net, Jacob's Ladder or line.

A downed airman must be able to submerge for a period of time in order to avoid strafing of enemy aircraft, and in addition, the ability to swim under water may be very helpful when trying to escape through a surface covered with burning oil. Another phase of this training period teaches the pilot the correct method of going over the s carrier or transport ship in tl a disaster. Survivors should over the side by a cargo net, lines provided at all abandoi tions. Cadets are trained in method of descent, and if tl means are not available duri aster they are also taught way to jump as a last resor mary, the men are introduce rubber rafts and given pra training in how to board the survivor accounts tell of me fully ditching their planes, without injury, and being later in critical condition be were unable to climb aboard

Intermediate Instruction

During the intermediate st struction, the pilots receive t the proper use of their emerge ment during an overwater dis learn the proper water tech abandoning aircraft. Cadet get a taste of what it feels lik a plane down in the water pitch into the pool in a "Dilt er." This training device is c from the cockpit of a SNJ–3 with shoulder straps and sa The machine is catapulted d foot ramp at a 45° angle tr the rate of 20 miles per ho strikes the water, an auto flops the cockpit over and tra himself in the water upside- 15 seconds the pilot extricat from his safety belt, parachu and shoulder strap (which h its value by keeping his h smashing against the instrun and cockpit cover), swims t face, and boards his rubber r

At the Primary Station, cade to board their rubber rafts. advanced training at Interme vides instruction in the meth eration, inflation, and mechar latest models of pneumatic ra are instructed in the use of th of the back pad kit and the kits with larger rafts, such gear, oars, knife, inflation p Care, test, inflation, adjustmer of the "Mae West" is taught l demonstration, and actual par

A pilot's training is not cor til he has had training in bail-out into water. Lectures out cover all features inv

eparture, descent, and landing.
ion in the use of oxygen when
from high altitudes is in-
The parachute is the pilot's
tation ticket to the water so he
ow how to care for it to insure
will function properly when he
s into space.
ity to shed the parachute har-
getting fouled up in the shroud
s proved fatal to potential Air
cue customers. Training and
given at the Navy schools have
dited with saving lives in "tes-
s" of survivors who bailed out.
r to "check-out," a pilot must
ccessfully made a minimum of
mps into water. The test, made
parachute harness suspended
water, includes:
a swinging action the cadet
ricate himself from his para-
ithin a limited time as follows:
ease leg harness snaps.
ease chest snaps. Hold straps
unsnapped.
ease himself for fall by raising
erhead.
ation of the life jacket follow-
ll into water.
l toggles on life jacket to in-

late life jacket (to avoid de-
and permit pilot to swim under
where necessary—strafing, oil,
ris).
merge feet first, swim under-
r a distance of 25 feet.
late life jacket by mouth.
im to end of pool or 50 yards.
ilots appreciate this training.
lowing letter is one of many
from sincerely grateful Navy

. On the _____ I had
out of my Corsair aircraft

to the very excellent 'Dunking
urse I was given at _____,
ole incident occurred without
I would like to express my
eat gratitude at having been
nough to have had the oppor-
o take this course. From bail-
eing picked up by a rescue boat,
what to expect, and what is
portant, exactly what to do.
l to do away with all panic and
a lot of confidence in myself.
y hope that every flier has this
e opportunity in taking this
training, because in my estimation it undoubtedly is a *great* lifesaver."

SURVIVAL AQUATICS IN ARMY AIR FORCES

Army Air Forces personnel are required to have training in Survival Aquatics as outlined in AAF Letter 50–57, dated 12 October 1944. The water survival instruction is given under the provisions of Army Air Forces Regulation 50–14, "Physical Training."

Skills taught in the AAF program include the elementary and basic swimming strokes, modified swimming simulating injury, escape through and under simulated unignited and burning oil, defense against strafing, artificial flotation with inflated clothing and debris, abandoning ship by nets, ladders, and lines, use of rubber rafts and life jackets, lifesaving carries, artificial respiration, and escape from a parachute harness.

Basic texts for the swimming program are FM 21–22 "Watermanship," American Red Cross Manuals, and Pilot's Information File.

HELICOPTER SCHOOL

The first military helicopter training school has been established by the AAF at Freeman Field, Ind. (*Tech Talk*, Air Force, October 1944).

BACK STIFFENER

Back type parachutes may get a new form-fitting, flexible back stiffener to defeat complaints that present types lose their stiffness (*Tech Talk*, Air Force, October 1944).

LANDPLANE DITCHING, PART II

(*Continued from page 9*)

6. Provide an adequate number of ditching exits in the region of ditching stations.

7. Secure the pilot's seat to withstand a minimum of 10 G's at least, and any other seats which must be occupied in ditching with adequate shoulder harness.

8. Whenever possible, design flaps to collapse on water impact without causing pitching.

9. Secure all gear such as radio, fire extinguishers, hatchets, etc., to withstand at least 10 G's.

FILM REVIEWS

Ditch and Live (TF 1–3385 or MA–4489). This training film, produced by the First Motion Picture Unit of the Army Air Force, is designed to instruct all airmen in the importance of thorough knowledge of correct ditching procedure. The film first points out very graphically what can happen in the event of ditching by showing an improperly trained crew who were forced to ditch their plane. Only one man, the copilot, is fortunate enough to survive. He profits by this experience and later when he is made pilot of a B–17 he realizes that it is his responsibility as pilot to properly train his crew to meet a ditching emergency. On days when the plane is grounded by bad weather he carefully drills his men in the technique of ditching and the use of equipment.

During dry drills the crew members learn the contents of the various types of emergency kits, the method of releasing the life rafts, and their assigned duties when the ditching signal is given. Each man is shown going through his own particular task, such as jettisoning the ammunition, sending the radio distress signals, assembling the emergency equipment, and bracing himself for the impact. Animated shots illustrate how the crew members perform their duties simultaneously and assume their ditching stations.

The wet drills, performed on a mock-up model of the plane, are the next phase of the advanced preparation of the crew. They are taught how to abandon the plane, how to board the life raft, how to right it should it be overturned, and the proper procedure to follow after boarding the raft in order to facilitate rescue.

To emphasize the value of the training the crew is shown in a simulated forced landing at sea when returning from a bombing mission. The pilot selects his landing spot with relation to the velocity and direction of the wind and the conditions of the sea. Each man automatically performs his duties and all members of the crew quickly leave the plane, board the rafts, and are subsequently rescued.

(*Continued on page 26*)

NEW AIR SEA RESCUE REPORT

Adopted by Navy

REQUIRING DITCHING DETAIL

The new Navy form Navaer—1941(10-44), Air Sea Rescue Report, printed below replaces Form 852 for inter ditching survivors. This report is comprehensive in that it may be answered briefly and concisely with the exceptic "Narrative" section which demands a detailed account of the entire incident.

The information obtained is intended to assist engineers improving aircraft design to withstand the impact of d to aid personnel engaged in the development and production of emergency equipment to determine the adequacy of gear; and to help survival instructors gather valuable material to emphasize in their training programs.

AIR SEA RESCUE REPORT

NAVAER—1941(10-44)

INSTRUCTIONS—This report shall be executed by the ACI Officer and forwarded via the Commanding Officer of the unit where the survivor(s) first become available for interrogation. Originate in triplicate—send original only to Navy Department, Office of the Chief of Naval Operations, Air Intelligence Group (OP-16-V), Washington 25, D. C., and the duplicate to COMAIRPAC or COMAIRLANT.

Answers to questions should be complete and concise with any supplemental information, explanation or comment covered fully in the "Narrative" section. A statement from the Aviation Equipment Officer is desirable in all cases and is required whenever defective equipment is reported.

Security classification												
Identification	Aircraft model		Bureau No.		Activity aircraft assigned			Activity submitting report				
Departure Data	Point		Mission		Time	Date	No. aboard	Fuel (gal)	Cargo (lb.)	B		
Decision to land	Location		Altitude	Time	Date	Cause						
Physical conditions	Weather	Visibility	Moon	Clouds	Wind velocity	Wind direction	Sea con					
	Wave height Ft.	Swells: Crest to crest Ft., crest to trough Ft., angle to sea °, angle to wind °										

Preparation for ditching:

Distress signal transmitted					DR Position		DF Fix obt	
Time	Date	Altitude	I. F. F. ☐ Yes ☐ No	Frequencies	☐ Transmitted ☐ Acknowledged		☐ Yes	☐
Other distress procedure employed		Bomb door position		Wheel position	Prop. feathered		Flap settir	
		☐ Open ☐ Closed		☐ Up ☐ Down	☐ Yes ☐ No		Approach	In
Load jettisoned				Engines used		Speed		
Fuel (gal.)	Cargo (lb.)	Bombs (lb.)	Equipment (lb.)	On approach	On landing	On approach	On land	
Number parachuted	Type parachute		Remarks covering landings					

Aircraft ditched:

Angle of plane relative to—			Impact violence		Slew noted		Water shippe	
Wind	Swells	Waves	First	Second	☐ Yes ☐ No	If yes, when	Volume	Leal

Number immersed		Escape hatches				Number aboard drilled in a/s rescue	Plane damage noted
Crew	Others	Functioning	No. used	No. jammed	No. submerged		

Personnel	In ditching position	Out of ditching position	Plane sank ☐ Nose first ☐ Tail first ☐ Broke
Killed			Part last sunk
Escaped			Time last sinking

Survival equipment: List separately items of available equipment worn in the water and those used while adrift and/or lost and for each cover any difficulty experienced, suggested remedies, recommended additions or substitutions and possible improvements to equipment.

ibuting most to survival		Item contributing most to rescue				Last equipment inspection date		
ropped from & sur. craft	Plane or vessel identification	Time	Date	Height dropped (ft.)	Difficulty retrieving	Condition of item retrieved: Intact	Condition of item retrieved: Damage—Nature & Ext.	Value of assistance

	Total supply per person	Daily ration per person	Date exhausted	Supplemented by	Recommendations

st equipment used in traveling by sea or land, including improvised equipment. Describe hazards encountered and means of overcoming. For land travel, type of terrain, purpose and duration of camp sites and the helpfulness or hostility of natives contacted.

ıd health:

Name	Nature of case and portion affected	When developed	Cause	Severity	Treatment or aid given	Survivor's condition

ir and surface:

dentification l station	Distance sighted	Time	Date	Position	Causes of failure
					Signaling devices available, those used, and those which would have been desirable.

ndations:

Number picked up				Casualties	
g craft	Delivered to	By craft summoned	Delivered to	Dead	Ill—Injured

Additional craft involved		Difficulties experienced in effecting transfer(s):
ntification	Position	

Survivor suggestions:	Suggestions by O-IN-C rescue:

Narrative: Make this section a full summation of the entire incident with appropriate emphasis on circumstances, conditions, equipment efficiency and
tions. Include a brief chronological account of search and/or rescue operations conducted. If practicable, trace the course of communications an
by rescuing agencies. Use separate blank sheets for continuation and attach securely to this report.

Date Signed

Forwarded:

Comment:

Date Signed USN ( ), comm

METHODS FOR LOCATING SURVIVORS

(*Continued from page 3*)

a smoke pot overboard or by observing the smallest waves, which will go with the wind. The wind force may be estimated from a plane by observing the white caps and wind streaks on the ocean surface (see table 1). An estimate of the direction and force of the wind at the sea surface from the plane prior to ditching is invaluable in determining the initial drift at the time of ditching. If none of these wind reports are available, the wind must be estimated from weather charts or from exposed island stations in the vicinity. Outside the tropics, the wind velocity at the sea surface can be obtained from the distance between isobars on a synoptic weather chart. Use appropriate meteorological tables to determine the gradient wind, and multiply the value so obtained by 0.65 to obtain the velocity at the sea surface. The wind direction may be estimated from the course of the isobars by applying the rule that the wind deviates 80° to the right of the pressure gradient in the Northern Hemisphere and 80° to the left in the Southern Hemisphere. In the tropics, the wind direction and velocity must be obtained from observations made on shipboard or at exposed island stations.

3. A separate vector diagram must be drawn to obtain the vector representing the current divergence caused by the local wind. Plot on a separate sheet a vector (fig. 3) representing the current caused by the local wind in the direction indicated in table 2. If the velocity of the local wind is given in knots, assume that the velocity of the current is 3½ percent of the wind velocity; if the Beaufort force of the local wind is used, obtain the velocity of the wind current from table 3. From table 3 obtain the velocity of the current caused by a wind with the Beaufort force of the nearest average wind arrow shown on the survival chart. Draw a vector (fig. 3–b) of this magnitude in the direction indicated in table 2 from the same point as the vector for the local wind current. The vector (fig. 3–c) drawn from the end of the average wind current vector to the end of the local wind current vector represents the direction and amount of current divergence.

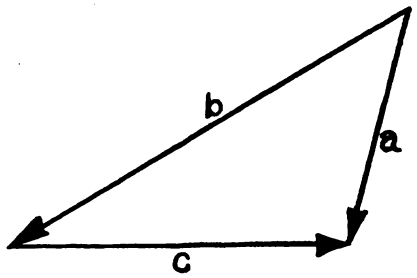


FIGURE 3.—Determination of current divergence caused by the local wind: (*a*) Current caused by local wind; (*b*) current caused by average wind; (*c*) current divergence.

4. From the end of the current vector plotted in 1, draw the current divergence vector determined in 3.

5. From plate II on page 25, determine the leeway of the raft caused by the local wind and draw a vector of this magnitude in a downward from the end of the vector d If it is not known whether a used by survivors on the raf way vectors should be drawn end of the current divergenc determine the probable positi raft with or without a dro example 5.)

6. The direction and amou in the first 24 hours after represented by the vector con original and final points of diagram.

Examples:

1. If the streamlines on th dicate a steadiness of less th cent, omit both the current the current divergence vecto stead a vector representing t caused by the local wind as d from table 3, with the dire cated in table 2. (See examp

2. When there is no local average current is affected a be if the local wind was in th direction from the average wir fore, if the local wind has be absent for 24 hours, omit the l tor from the vector diagram a current divergence vector ir site direction from the ave current; that is, determine th of the current caused by th wind from table 3, and draw of this magnitude from the average current vector in th direction from that indicated (See example 3.)

ft on subsequent days is deter- the same way, starting with ated position of the raft at the e preceding day. (See exam-

vival charts do not apply dur- er and April, but estimates of nts during these months can nade by comparing the winter mer charts for the same re- the two charts agree reason- , a fair estimate of the current btained. However, in regions e charts do not agree, variable s may be expected during nths; in such areas assume that ge current has a steadiness of 25 percent and determine the rrent from the local wind with of tables 2 and 3.

ABLE POSITION ERROR

sition of the point about which h is to be conducted is always o uncertainty. Not only is the position uncertain because of gational errors of the ditched l of the search planes, but there al probable errors in the esti- ift of the raft and these will progressive increase in the size arch area with the passage of he probable error in position ssumed to be equal to the total t divided by 8, plus the com- vigational errors of the ditched d the search planes.

obable error of the position at times may be shown on a large rt or plotting sheet by drawing with a radius equal to the d probable error around the cal- culated raft position at the beginning of the drift and at the end of each 24-hour period after ditching, and drawing tangents to these circles. The probable error at any time may then be determined by describing a circle tangent to the boundary lines about the appropriate point along the line of drift.

EXAMPLES

EXAMPLE 1.

Ditching position based on a navigational fix; average current with a steadiness greater than 25 percent; local wind force and direction different from average wind force and direction.

In July, a pilot reports that he is ditching at latitude 12°10′ N., longitude 147°10′ E. He reports an estimated surface wind of Beaufort 4 from the northeast. It is assumed that a drogue will be streamed to retard raft drift.

Search Radius at Time of Ditching

Probable error of position	14 miles.
Search radius (from plate I):	
First search	16 miles.
Second search	22 miles.
Third search	28 miles.
Fourth search	32 miles.
Fifth search	35 miles.

Determination of Search Area at End of 24 Hours

Average current (from survival chart S12–17, May–September):	
Direction	273°.
Velocity	10 miles per day.
Steadiness	75–100%.
Average wind (from survival chart):	
Direction toward which it blows	280°.
Force	Beaufort 1.
Local wind:	
Direction toward which it blows	225°.
Force	Beaufort 4.

Vector Directions and Magnitudes

1. Average current:	
Direction	273°.
Magnitude	10 miles.
2. Current caused by local wind:	
Direction (from table 2)	255°.
Magnitude (from table 3)	11 miles.
3. Current caused by average wind:	
Direction (from table 2)	310°.
Magnitude (from table 3)	2 miles.

4. Current divergence:	
Direction	246°.
Magnitude	10 miles.
5. Leeway:	
Direction	225°.
Magnitude (from plate II)	9 miles.
(NOTE: See ill. on next page).	
6. Probable drift:	
Direction	250°.
Distance	27 miles.

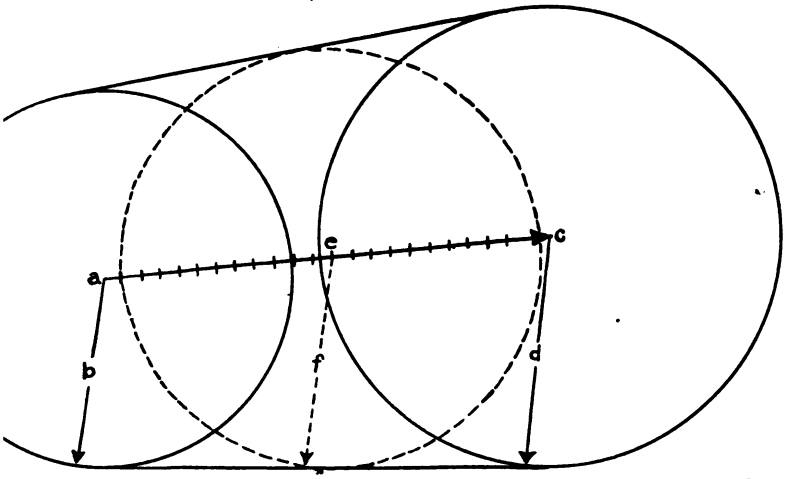
Search Radius at End of 24 Hours

Probable error of position $\left(\frac{27}{8}+14\right)$	17 miles.
Search radius (from plate I):	
First search	19 miles.
Second search	27 miles.
Third search	34 miles.
Fourth search	38 miles.
Fifth search	43 miles.

EXAMPLE 2.

Ditching position based on a navigational fix; average current with a steadiness less than 25 percent; local wind force and direction different from average wind force and direction.

In August, a pilot reports that he is ditching at latitude 8°12′ N., longitude 143°30′ E. The raft on his plane is not equipped with a drogue. Reports from ships and island stations in the vicinity indicate a wind from the northeast with a velocity of 10 knots.

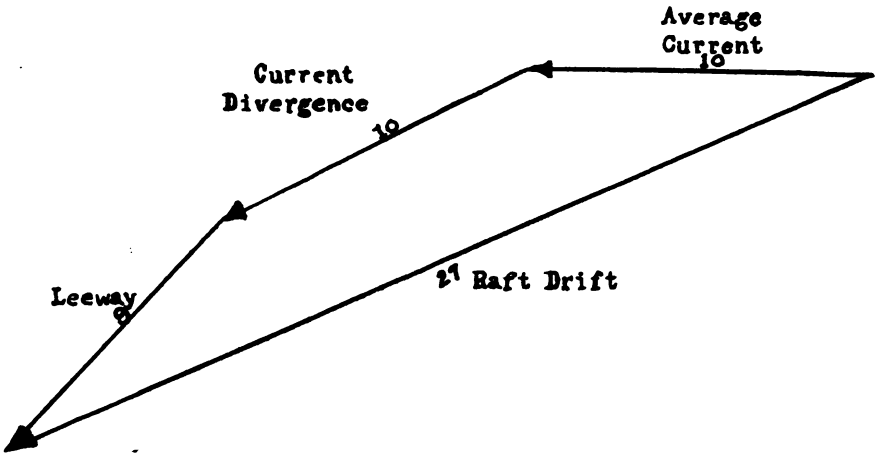


—Probable error of position: (*a*) Ditching position; (*b*) probable error of ditching ı; (*c*) position at end of 24 hours; (*d*) probable error of position at end of 24 hours; ition at end of 12 hours; (*f*) probable error of position at end of 12 hours.

Search Radius at Time of Ditching

Probable error of position---- 14 miles.
Search radius (from plate I):
- First search---------- 16 miles.
- Second search---------- 22 miles.
- Third search---------- 28 miles.
- Fourth search---------- 32 miles.
- Fifth search---------- 35 miles.

3. Current caused by average wind: Omit.
4. Current divergence: Omit.
5. Leeway:
   - Direction---------- 225°.
   - Magnitude (from plate II) 20 miles.
6. Probable drift:
   - Direction---------- 225°
   - Distance---------- 28 miles



Determination of Search Area at End of 24 Hours

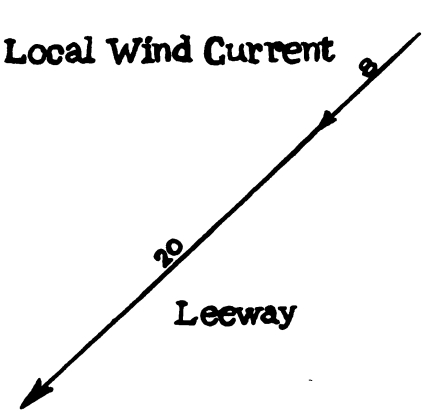
Average current (from survival chart S12-2-40, May-September):
- Direction---------- 230°.
- Velocity---------- 6 miles per day.
- Steadiness---------- 0-25%.

Average wind (from survival chart):
- Direction toward which it blows---------- 276°.
- Force---------- Beaufort 1.

Local wind:
- Direction toward which it blows---------- 225°.
- Velocity---------- 10 knots.

Vector Directions and Magnitudes

1. Average current: Omit.
2. Current caused by local wind:
   - Direction (from table 2) 225°.
   - Magnitude (3½% of 10 x 24) 8 miles.



Search Radius at End of 24 Hours

Probable error of position
$\left(\frac{28}{8}+14\right)$ ---------- 18 miles.

Search radius (from plate I):
- First search---------- 20 miles.
- Second search---------- 29 miles.
- Third search---------- 36 miles.
- Fourth search---------- 41 miles.
- Fifth search---------- 45 miles.

EXAMPLE 3.

Ditching position based on a navigational fix; average current with a steadiness greater than 25 percent; no local wind.

In September, a pilot reports that he is ditching at latitude 12°55′ N., longitude 168°20′ E., and that a calm prevails in the area.

Search Radius at Time of Ditching

Probable error of position---- 14 miles.
Search radius (from plate I):
- First search---------- 16 miles.
- Second search---------- 22 miles.
- Third search---------- 28 miles.
- Fourth search---------- 32 miles.
- Fifth search---------- 35 miles.

Determination of Search Area at End of 24 Hours

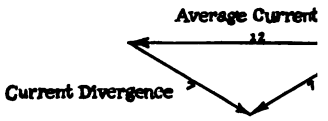
Average current (from survival chart S12-19, May-September):
- Direction---------- 270°.
- Velocity---------- 12 miles per day.
- Steadiness---------- 50-75%.

Average wind (from survival cha
- Direction toward which it blows---------- 270
- Force---------- Be

Local wind: None.

Vector Directions and Mag

1. Average current:
   - Direction---------- 270
   - Magnitude---------- 12
2. Current caused by local wind:
3. Current caused by average win
   - Direction (from table 2). 300
   - Magnitude (from table 3) 7 m
4. Current divergence:
   - Direction (reciprocal of 300°)---------- 120
   - Magnitude---------- 7 m
5. Leeway: None.



6. Probable drift:
   - Direction---------- 240
   - Distance---------- 7 m

Search Radius at End of 2

Probable error of position ($\frac{7}{8}$+14)---------- 15
Search radius (from plate I):
- First search---------- 17
- Second search---------- 24
- Third search---------- 30
- Fourth search---------- 34
- Fifth search---------- 38

EXAMPLE 4.

Ditching position unknown

A plane takes off from No land at 0600 on 15 August Guam. It is due at that d at 1130. The plane has bee since it last reported at 0700 t following its course by dead It is assumed that the crew use a drogue after ditching.

The following tables and illustrate the probable erro ditching area and the search the end of the first and sec The search areas are calcul 24-hour drift from any point track of the plane and nec altered if the search planes same direction and at the s as the ditched plane; if t planes fly in the opposite direc ever, the amount of drift f point must be decreased or in take into account the time, r ditching, that the search plane each point along the line of

Determination of Search Area at End of 24 Hours

itching position:									
n base	200	300	400	500	600	700	800	900	1000
itude	1°43′	3°06′	4°26′	5°50′	7°23′	8°33′	9°56′	11°18′	12°40′
itude	136°43′	137°40′	138°36′	139°33′	140°31′	141°28′	142°25′	143°22′	144°20′
rror of ditching 5 percent of dis- n from base)	10	15	20	25	30	35	40	45	50
urrent (from sur- charts S8A–10–1, 0, S12–17, May- ber):									
	70°	90°	90°	100°	180°	230°	270°	270°	270°
n miles	10	30	20	8	3	5	12	8	7
s	25–50	50–75	75–100	25–50	0–25	0–25	50–75	50–75	75–100
nd (from survival									
	67°	67°	67°	67°	276°	276°	290°	290°	290°
Force	1	1	1	1	1	1	1	1	1
(from plane and orts):									
	90°	67°	22°	Calm	337°	315°	292°	270°	270°
Force	3	2	2		2	2	3	4	5
ised by local wind: (from table 1)	90°	67°	22°		337°	315°	292°	300°	300°
in miles (from	7	4	4	None	4	4	7	11	16
used by average									
(from table 1)	67°	67°	67°	67°			290°	320°	320°
in miles (from	2	2	2	2	Omit	Omit	2	2	2
livergence (from liagram):									
	98°	67°	353°	247°			290°	296°	298°
in miles	5	2	3	2	Omit	Omit	5	9	14
(downwind)	90°	67°	22°		337°	315°	292°	270	270°
in miles (from)	18	13	13	None	13	13	18	22	25
lrift (from vector):									
	86°	83°	59°	110°	337°	315°	284°	276°	278°
n miles	33	44	29	6	17	17	34	38	45
osition at end of 24									
itude	1°45′	3°10′	4°40′	5°47′	7°29′	8°46′	10°03′	11°23′	12°46′
itude	137°16′	138°24′	139°02′	139°39′	140°22′	141°14′	141°51′	142 43′	143°34′
ror of position in ft plus probable itching position)	14	21	24	26	32	37	44	50	56
us in miles for first om plate I)	16	23	27	29	35	41	49	55	62

Determination of Search Area at End of 48 Hours

litching position m base)	200	300	400	500	600	700	800	900	1000

(Tables continued on page 24)

EXAMPLE 5.

Ditching position based on a navigational fix; average current with a steadiness greater than 25 percent; local wind force and direction different from average wind force and direction; no information ouse of drogue.

In December a pilot reports that he is ditching at latitude 10°10′ N., longitude 126°30′ E. The surface wind in the vicinity is blowing from the northwest with a velocity of 15 knots. It is uncertain whether or not a drogue will be streamed.

Search Radius at Time of Ditching

Probable error of position ... 14 miles.

Search radius (from plate I):
- First search ... 16 miles.
- Second search ... 22 miles.
- Third search ... 28 miles.
- Fourth search ... 32 miles.
- Fifth search ... 35 miles.

Determination of Search Area at End of 24 Hours

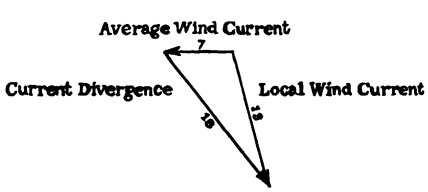
Average current (from survival chart S–8B–4, November–March):
- Direction ... 180°.
- Velocity ... 14 miles per day.
- Steadiness ... 75–100%.

Average wind (from survival chart):
- Direction toward which it blows ... 240°.
- Force ... Beaufort 3.

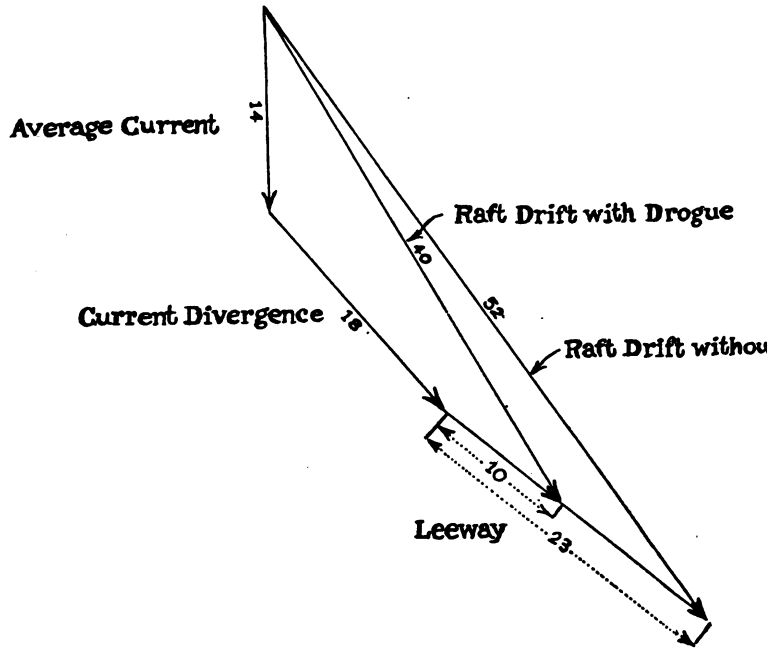
Local wind:
- Direction toward which it blows ... 135°.
- Velocity ... 15 knots.

Vector Directions and Magnitudes

1. Average current:
   - Direction ... 180°.
   - Magnitude ... 14 miles.
2. Current caused by local wind:
   - Direction (from table 2) 165°.
   - Magnitude (3½% of 15×24) ... 13 miles.
3. Current caused by average wind:
   - Direction (from table 2) 270°.
   - Magnitude (from table 3) 7 miles.



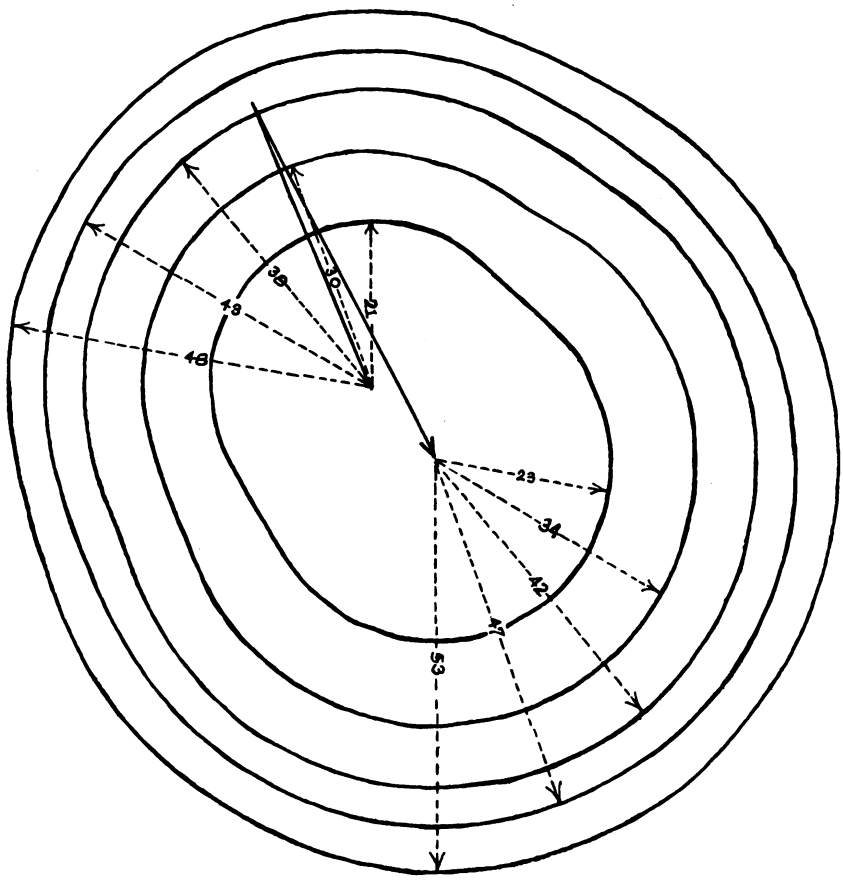
4. Current divergence:
   Direction---------- 140°.
   Magnitude---------- 18 miles.
5. Leeway:
   Direction---------- 135°.
   Magnitude (from plate II):
      With drogue------- 10 miles.
      Without drogue---- 23 miles.
   (*Note: See figure in opposite column.*)
6. Probable drift:
   With drogue:
      Direction---------- 152°.
      Distance----------- 40 miles.
   Without drogue:
      Direction---------- 148°.
      Distance----------- 52 miles.



Search Radius at End of 24 Hours if Drogue Is Used

Probable error of position
$(\frac{40}{8}+14)$---------- 19 miles.

Search Area at End of 24 Hours



Search radius (from plate I):
   First search---------- 21
   Second search--------- 30
   Third search---------- 38
   Fourth search--------- 43
   Fifth search---------- 48

Search Radius at End of 2
Drogue Is not Use

Probable error of position
$(\frac{52}{8}+14)$---------- 21

Search radius (from plate I):
   First search---------- 23
   Second search--------- 34
   Third search---------- 42
   Fourth search--------- 47
   Fifth search---------- 53
   (*Note: See figure in opposite*

Search Area at End of 48

To determine the probabl
of the raft with or without a
the end of 48 hours, determi
with a drogue from the end o
representing the drift with
during the first day and the
out a drogue from the end of
representing the drift witho
during the first day. The se
may then be determined for
able position and corrected l
in the same way as the searc
drawn at the end of 48 hours.

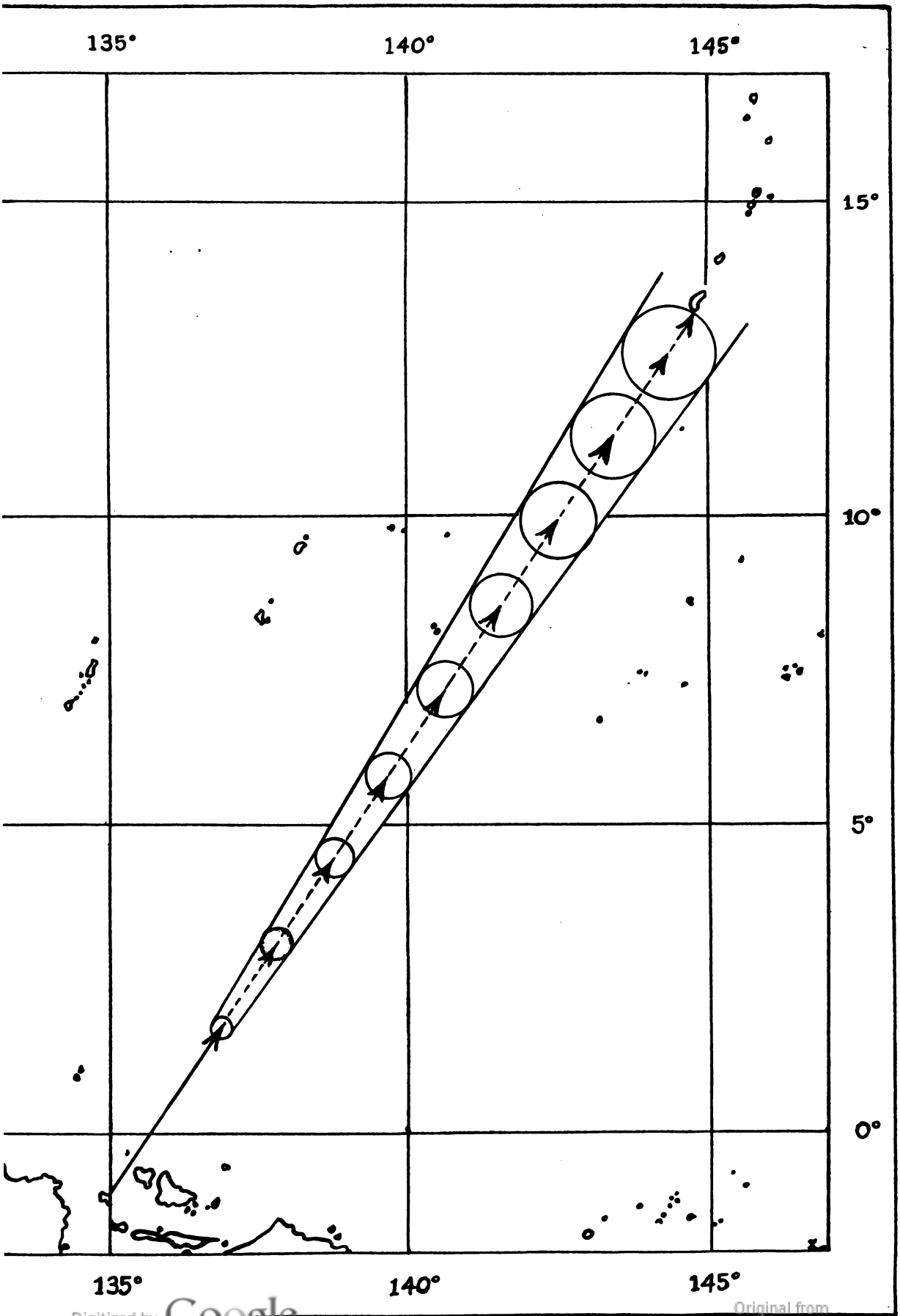


FIGURE 4.—Probable error of ditching position.

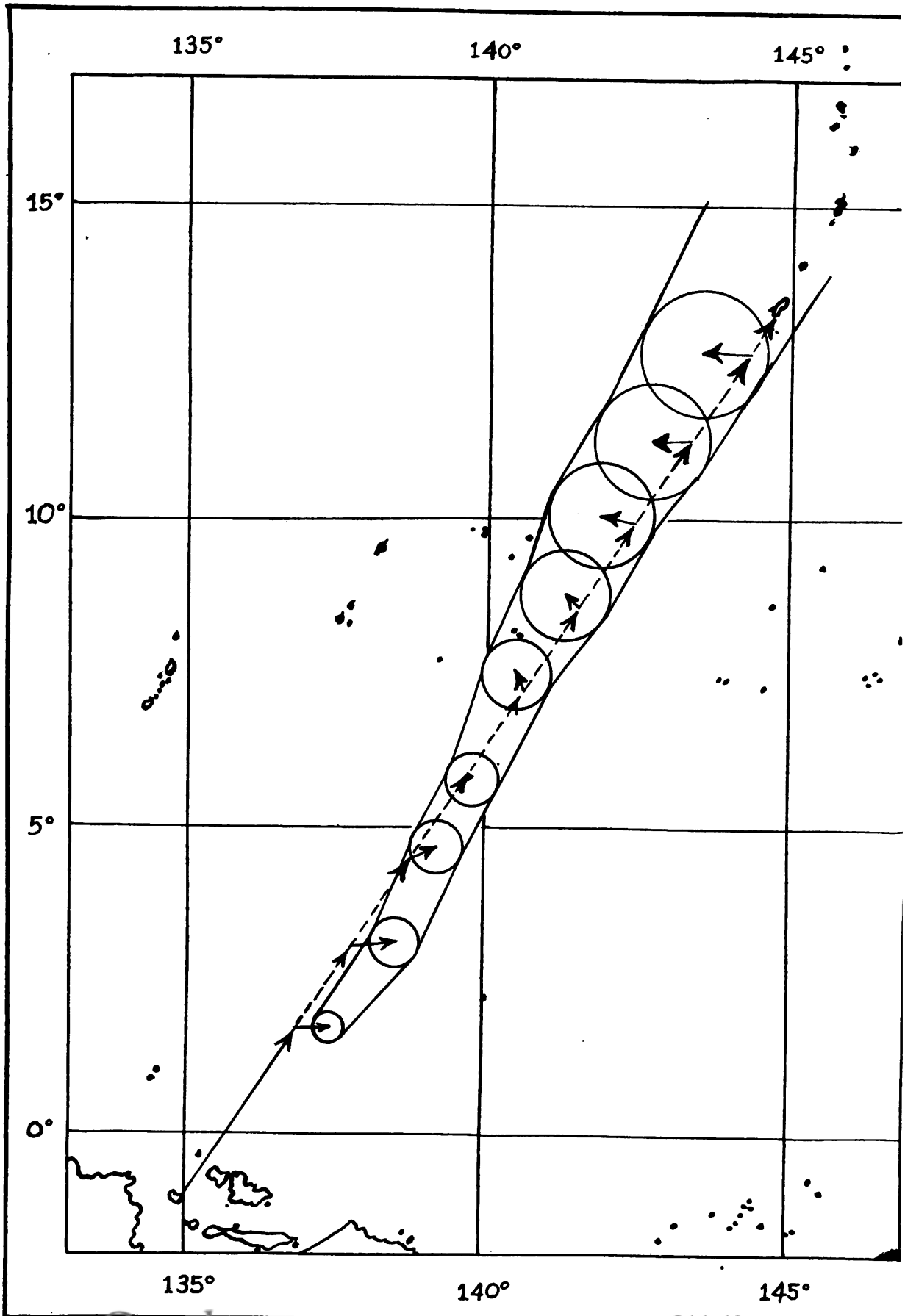


FIGURE 5.—Search area at end of 24 hours.

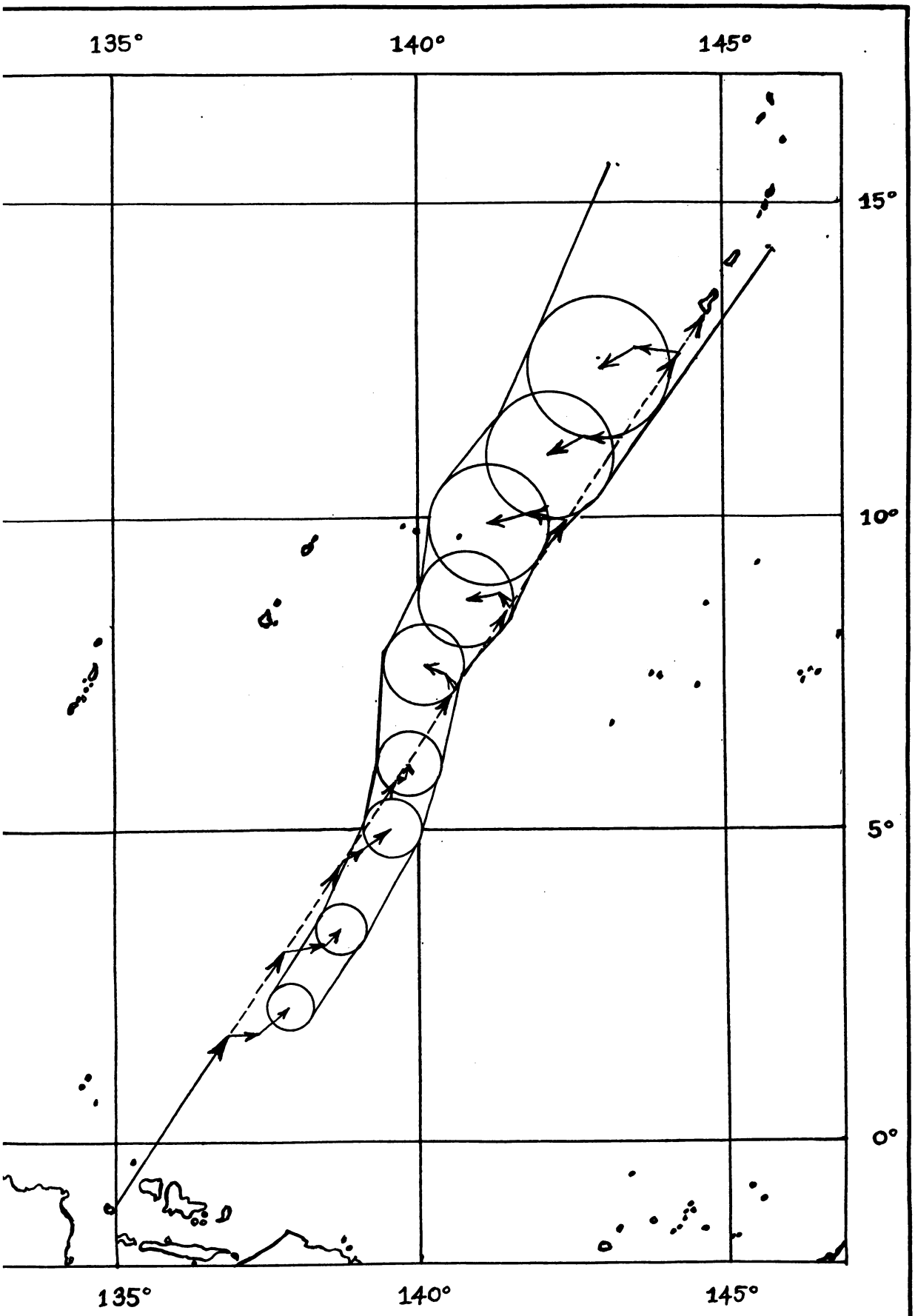


FIGURE 6.—Search area at end of 48 hours.

PLATE I

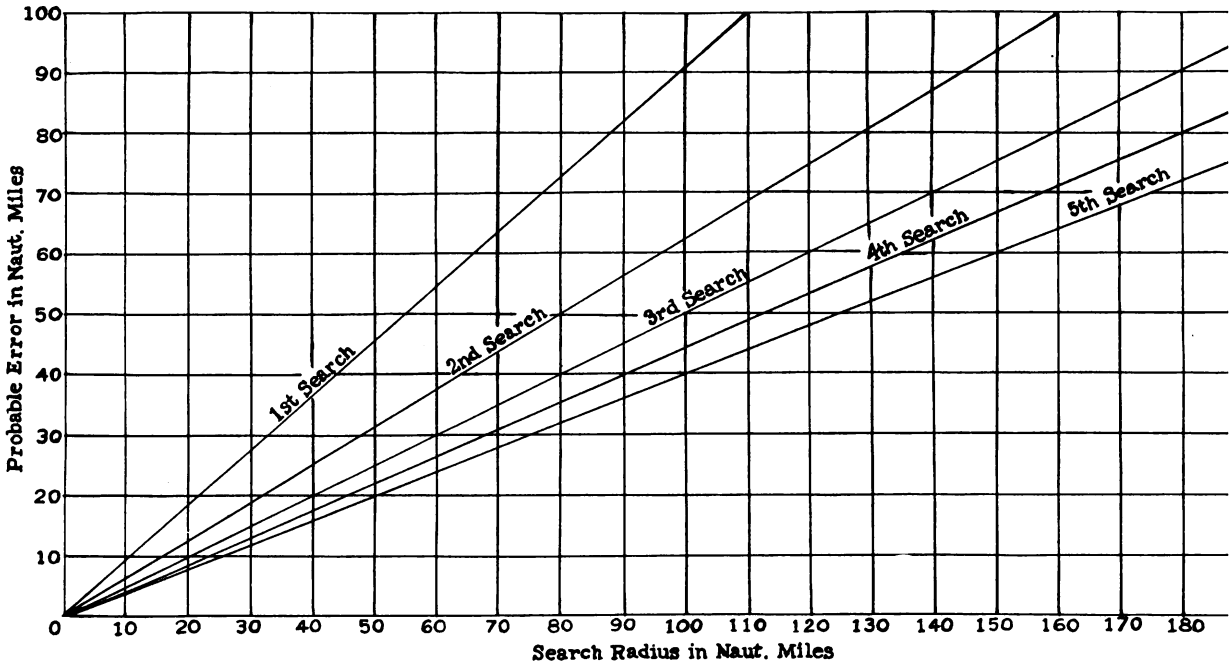


PLATE I: Search radius. Relationship of search radius to probable error of position of first five searches.

TABLE 1

SURFACE WIND FORCE PREDICTION FROM SEASURFACE APPEARANCE

Wind (Beaufort Scale)	Wind speed (knots)	Surface condition as seen from the air [1]	Surface condition as seen from the sea surface [2]
0	Less than 1	Smooth, slick sea	Sea like a mirror.
1	1–3	Small ripples with calm areas	Ripples—no foam crests.
2	4–6	Ripples everywhere, or well defined waves which are smooth and do not break.	Small wavelets; crests have a glassy appearance and do not break.
3	7–10	Occasional whitecaps	Large wavelets; crests begin to break; scattered whitecaps.
4	11–16	Pronounced waves, frequent whitecaps; slight to clearly defined wind streaks whose lengths may be equal to about 10 wave lengths.	Small waves becoming longer; frequent whitecaps.
5	17–21	Long, well defined wind streaks with waves and streaks coming from same direction.	Moderate waves, taking a more pronounced long form; many whitecaps, some spray.
6	22–27	Large seas with waves forming on them; wind picks up and carries occasional wave crest.	Large waves begin to form; extensive whitecaps everywhere; some spray.
7	28–33	Heavy seas; pronounced streaks; wind picks up and carries most wave crests; breaking, rolling waves are forming.	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind.
Over 7	More than 33	Continual rolling waves; well defined waves form on some or all of the heavy seas; wind carries along all wave crests for a distance equal to at least one-half wave length; scud or foam streaks.	Moderately high to high waves of greater length; edges of crests break into spindrift and spray may affect visibility; well marked or dense streaks of foam along the direction of the wind.

[1] Adapted from "Aleutian Sense," Training Division, Bureau of Aeronautics, U. S. Navy.
[2] From U. S. Navy Deck Log Book (revised 1 Jan. 1944).

TABLE 2

RELATION OF THE DIREC THE WIND CURRENT DIRECTION OF THE WIN

Latitude	*Div Win fr D*
North of 10° N	30° t
10° N. to 10° S	Down
South of 10° S	30° t

TABLE 3

VELOCITY OF THE WIN RENT IN MILES PER

Wind (Beaufort force)	Wind speed (knots)	Wi (mil
1	1–3	
2	4–6	
3	7–10	
4	11–16	
5	17–21	
6	22–27	
7	28–33	

CLOTH SURVIVAL CH

Cloth survival charts showin streamlines and resultant w published and distributed by telligence Group, Division Intelligence, Office of the Chief Operations, Navy Departmer ington, D. C.

aterproof "handkerchief" has
rinted on each side.
backed up are grouped to-

No	Title
___	Western Pacific.[1 2]
___	Do.[2 3]
25_	Bismark Archipelago and Northwest Solomon Islands.[1 3]
n d	Southeast Solomon Islands and Santa Cruz Islands.[1 3]
___	East Caroline Islands.[1 3]
___	Marshall Islands.[1 3]
___	Admiralty Islands and Northwest Bismark Archipelago.[1 3]
___	North Central New Guinea.[1 3]
___	Marianas Islands.[1 3]
___	Central Caroline Islands.[1 3]
___	Western Caroline Islands.[1 3]
___	Palau Island Area and Northwest New Guinea.[1 3]
___	Luzon and Taiwan Islands.[3]
___	Mindanao, Philippine Islands.[3]
___	Bonin Islands.[3]
___	Okinawa Shima and Parece Vela.[3]

ed with currents and winds for
mber.
rinted on paper as H. O. Misc.
distributed by the Hydrographic

ed with currents and winds for
-March.

urvival charts showing current
es and resultant winds are
by Headquarters, Aeronauti-
Service, U. S. Army Air Forces,
ibuted within the U. S. Navy
ntelligence Group, Division of
telligence, Office of the Chief
Operations, Navy Department,
on, D. C.
aterproof "handkerchief" has
re charts printed on each side.
backed up are grouped to-

	Title
___	French Indochina.[1]
___	Central China.[1]
___	Southeast China.[1]
___	Northeast China.[1]
___	Southeast China.[2]
___	Luzon Island.[2]
___	Korea.[1]
___	Mindoro Island.[2]
___	Samar Island.[2]
___	Mindanao Island.[2]
___	North Borneo.[2]
___	Kagoshima, Japan.[1 3]
___	Nagasaki, Japan.[1 3]
___	Osaka, Japan.[1 3]
___	Tokyo, Japan.[1 3]
___	Peiping.[1 3]
___	Ryozyum.[1 3]
___	Keizyo.[1 3]
___	Kanazawa, Japan.[1 3]
___	Sendai, Japan.[1 3]

(Tables continued from page 18)

Probable error of ditching position (5 percent of distance flown from base)	10	15	20	25	30	35	40	45	50
Probable position at end of 24 hours:									
North latitude	1°45′	3°10′	4°40′	5°47′	7°29′	8°46′	10°03′	11°23′	12°46′
East longitude	137°16′	138°24′	139°02′	139°39′	140°22′	141°14′	141°51′	142°43′	143°34′
Average current (from survival charts S8A-10-1, S12-2-40, S12-17, May-September:									
Direction	70°	80°	90°	100°	190°	240°	270°	300°	300°
Velocity in miles	10	20	18	8	3	10	12	8	6
Steadiness (percent)	25–50	25–50	75–100	25–50	0–25	25–50	50–75	25–50	25–50
Average wind (from survival charts):									
Direction	67°	67°	67°	67°	276°	276°	290°	290°	290°
Beaufort Force	1	1	1	1	1	1	1	1	1
Local wind (from plane and ship reports):									
Direction	45°	22°	22°	0°	292°	270°	247°	225°	225°
Beaufort Force	4	2	2	2	3	3	4	4	5
Current caused by local wind:									
Direction (from table 1)	45°	22°	22°	0°	292°	270°	277°	255°	255°
Velocity in miles (from table 2)	11	4	4	4	7	7	11	11	16
Current caused by average wind:									
Direction (from table 1)	67°	67°	67°	67°	Omit	276°	320°	320°	320°
Velocity in miles (from table 2)	2	2	2	2		2	2	2	2
Current divergence (from vector diagram):									
Direction	40°	354°	354°	330°	Omit	268°	269°	245°	249°
Velocity in miles	9	3	3	4		6	10	9	14
Leeway:									
Direction (downwind)	45°	22°	22°	0°	292°	270°	247°	225°	225°
Velocity in miles (from plate II)	22	13	13	13	18	18	22	22	25
Probable drift (from vector diagram):									
Direction	50°	42°	56°	23°	292°	261°	259°	243°	241°
Velocity in miles	41	22	27	17	25	33	42	34	41
Total drift in miles (drift during first 24 hours plus drift during second 24 hours)	74	66	56	23	42	50	76	72	86
Probable position at end of 48 hours:									
North latitude	2°18′	3°27′	4°55′	6°03′	7°36′	8°04′	9°54′	11°07′	12°25′
East longitude	137°55′	138°39′	139°25′	139°45′	140°00′	140°42′	141°10′	142°12′	142°57′
Probable error of position in miles ($\frac{\text{total drift}}{8}$ plus probable error of ditching position)	19	23	27	28	35	41	50	54	61
Search radius in miles for first search (from plate I)	21	26	30	31	39	45	55	60	67

NK54_____. Hakodate.[1 3]
NK55_____. Nemuro.[1 3]

[1] In preparation with currents and winds for November–March.

[2] Published with currents and winds for November–March.

[3] In preparation with currents and winds for May–September.

PLATE II

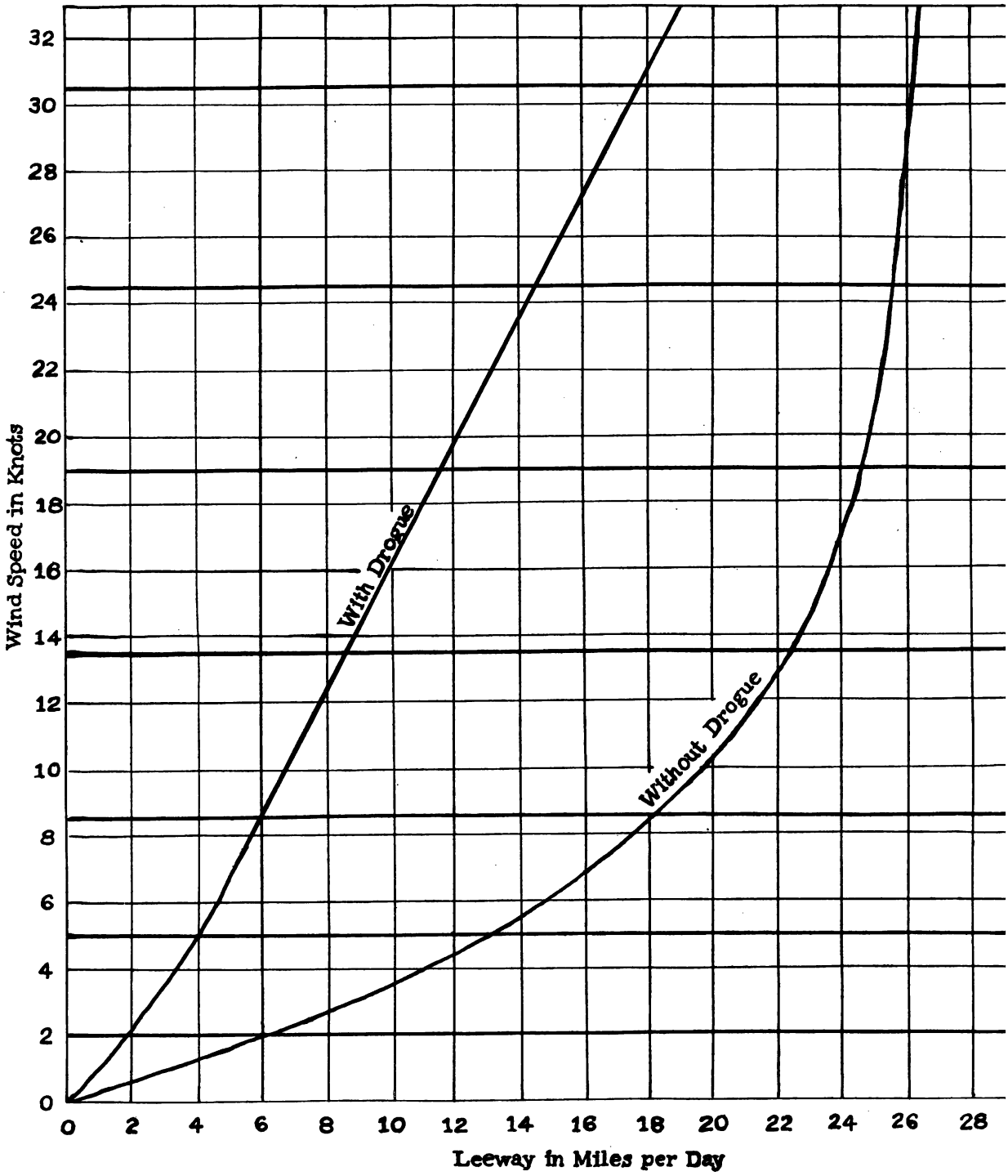


PLATE II : Leeway of rubber raft. Relationship of leeway of raft, with and without drogue, to wind speed or force

M REVIEWS

ontinued from page 12)

, an Americanized version of
training film "Prepare For
uses a B–17 Flying Fortress
American equipment through-
ing time: 49 minutes.

---

rachute Harness (TF 1–3391
8). This instructional film
es the importance of the
and shoulder harness to the
is forced to crash land his
Flight Surgeon illustrates his
h a model similar to the de-
by the Matériel Command at
eld to test deceleration rate
of G. A dummy, strapped to
seat, is shot down a runway
comparable to crash landing
the "imitation" pilot reaches
nent panel, he strikes it with
impact simulating actual con-

nonstration shows the disas-
ome when the pilot crushes
against the array of instru-
protrusions on the panel of his
ne. Then whatever happens
ot fails to fasten either his
or harness is demonstrated.
these safety devices secured
s of escaping injury are in-
The Flight Surgeon demon-
correct method of fastening
when stunting or when forced
and or water.

OK REVIEW

AL AND RESCUE ERIAL IN ARCTIC UAL—STEFANSSON

ehensive study by one of the
world authorities on that re-
jalmur Stefansson's ARCTIC
should be included on the
shelves of everyone interested
ng and working conditions of

Continued on page 29)

PUBLICATIONS RECEIVED

Air Sea Rescue Agency Technical Library

October 11–November 4, 1944

BIBLIOGRAPHIES

U. S. Navy Dept. Office of the Chief of Naval Operations. Aviation Training Division.
Rescue Survival and Related Publications. Mimeographed. 1944.

AIR-SEA-LAND RESCUE SERVICE

U. S. Navy Dept. Office of the Chief of Naval Operations.
Plan for Air Sea Rescue. Washington, D. C., 1944. Mimeographed. (Restricted.)

EMERGENCY EQUIPMENT

U. S. Naval Air Training Center.
Comparison of Oxygen Mask Leak Testing Methods. Pensacola, Fla., 1944. (Processed.)
Comparison of Oxygen Mask Leak Testing Without Special Apparatus and by the Scholander Nitrogen Analyser. Pensacola, Fla., 1944. (Processed.)
U. S. Navy Dept., Bureau of Aeronautics.
Pocket Bubble Sextant. Washington, D. C., 1944.
U. S. Quartermaster School. Camp Lee, Va.
Keep Warm, Don't Be a Casualty. Camp Lee, Va., 1944.

LIFE RAFTS AND LIFEBOATS

U. S. Army Air Forces. Weather Division.
Effects of Wind and Ocean Currents on Drift of Life Rafts. Washington, D. C., 1944. Mimeographed. (Restricted.)

SIGNALS AND SIGNALING

U. S. Army Service Forces.
Chemical Warfare Supply Catalog; Stock List of All Items. Edgewood Arsenal, Md., 1944.

TRAINING

U. S. Army Air Forces.
AAF Training Standard No. 130–2. Emergency Rescue Units and Crews (aircraft). Washington, D. C., 1944.
U. S. Atlantic Fleet, Air Forces.
PBM Emergency Bills. U. S. Naval Air Station, Norfolk, Va., 1944. (Processed.)
U. S. Navy Dept., Bureau of Aeronautics. Training Division.
Air Masses and Fronts. Washington, D. C., 1944.
U. S. Navy Pre-Flight School, Chapel Hill, N. C.
Lecture Guide; Self-Preservation. Chapel Hill, N. C., 1944. Mimeographed.

ABSTRACTS

Final Report on the Use of Chemical Materials as Shark Repellent.

Results of tests conducted from 9 April 1943 to 1 July 1944. The Naval Research Laboratory presents the final report on the development and testing of a material designed for the protection of personnel from attack by sharks. Earlier laboratory development is summarized and the results of the field testing are presented in their entirety. Two types of a unit for the employment of the repellent material designed for individual protection are described: (1) A flat cake of the repellent material in a bag of cotton sheeting which is protected by a waterproof outer envelope made from a vinyl-copolymer-coated fabric. (2) A belt type to be worn around the waist, a unit designed for use by individuals who find it necessary to be in shark infested water by intent rather than by accident.

SOURCE: Final Report on the Use of Chemical Materials as Shark Repellent. Naval Research Laboratory, Anacostia Station, Washington, D. C. 23 September 1944. NRL Report No. P–2373.

(*Continued on page 29*)

Army's

WATER WEASEL

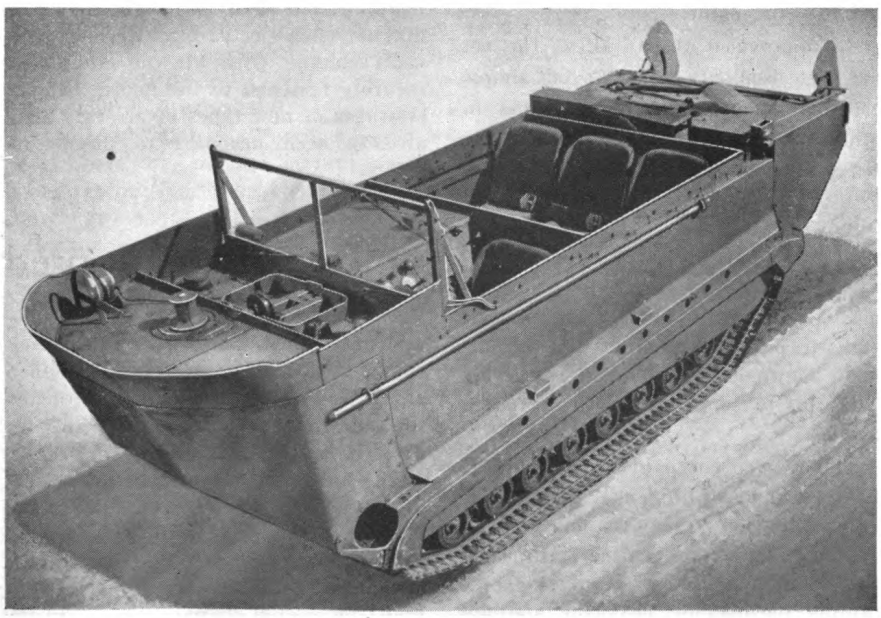
May Be Used in Water, Swamp, and Snow Rescue

The need for a vehicle or craft that could be used to rescue fliers forced down in swamps and mud flats where planes cannot land, boats cannot navigate, trucks and tractors are unable to operate, and where travel by foot is slow and sometimes impossible, has long been realized. Development of such a vehicle was begun in March 1943, upon a request from the Army Air Forces to the Office of Scientific Research and Development.

Investigation of the possibilities of amphibious vehicles that could cross swamps, water, mud, and snow revealed that there were no available vehicles possessing sufficient versatility. Adaptation of a vehicle already in existence was therefore started on the "Weasel," the Cargo Carrier, M29, the best snow vehicle available at the time. The outstanding advantage of the "Weasel" was its unusually low unit ground pressure.

As the "Weasel" has a watertight body and will float, initial tests required only the addition of outboard motors. The water speed of the vehicle at this stage of development was approximately two miles per hour. To increase the freeboard and water speed, a bow, stern, and side skirts were added. This change in design increased the water speed to 4 miles per hour and, because of the side skirts, it was propelled by its own tracks. Satisfactory maneuverability in water was provided by the addition of two rudders on th cell.

Successfully passing the r need, this amphibian was c named the Cargo Carrier, M29C, users have dubbed it the Weasel."

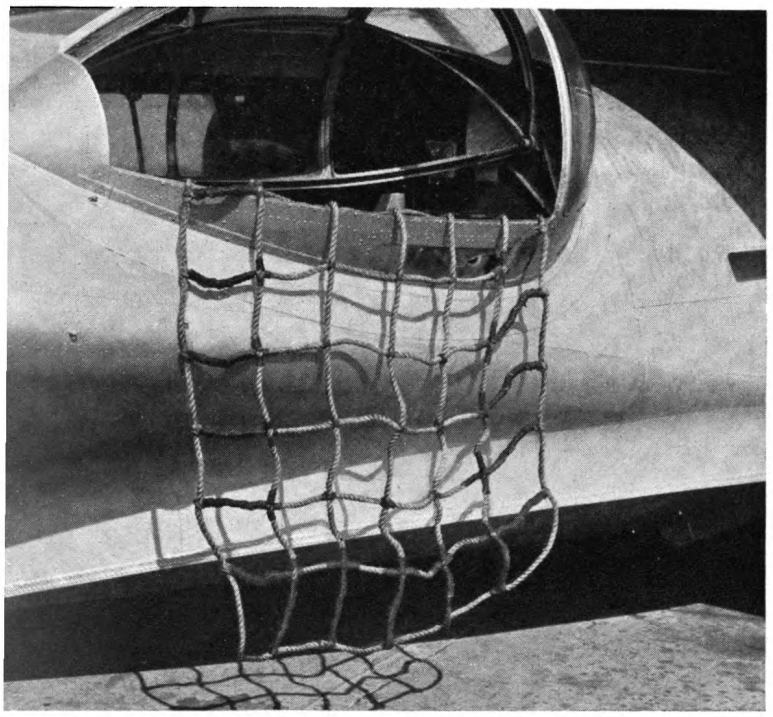


TWO LITTER CASES

It resembles a cross betwee slung automobile and a boat sloping brush-resisting bow. I ures 67 inches across the beam a feet in length. When empty it 4,800 pounds and is designed t port a pay load of 1,200 pound vehicle will carry, in addition driver, three passengers or tw cases. Provisions are included field installation of any one of bination of ten different standa tary vehicular radio sets. In th of an experienced driver, the Weasel" will successfully neg great variety of difficult terrai is impassable to conventional ve such terrain as mud, swamp, ri wet or dry sand, snow fields, a and rivers. Development of th cle has been the result of the c efforts of the Office of Scientific R

(*Continued on page 29*)

ESCUE RECOVERY NET



in construction to a cargo net, net for aircraft adaptation nprovised at the Coast Guard n, San Diego, Calif., by the scue Task Unit, Western Sea Southern Sector, to assist sur- climbing into the blister of a e hatch of other seaplanes. ed of 21-thread line, and 5 e, the net has snap hooks for chments to eyebolts fastened ship. When thrown over the e airplane, the net serves as it ladder for survivors to grab and climb. It is large enough for crewmen to climb down from the plane to assist a man in the water.

It has been suggested also that with lines extended from the lower corners of the net, a helpless person, whose injuries do permit, could be rolled up the net into the plane.

As improvised at San Diego the net has been used only on PBY's, but simple changes would make it adaptable to other types of aircraft engaged in air sea rescue assignments.

BRITISH DESIGN NEW CONTAINERS

One of the primary problems of ditched aircrews has been to ensure that the men take all the necessary emergency equipment aboard the dinghy when escaping from their sinking aircraft. The aim of the British has been to design dinghy equipment so that the raft would be automatically ejected with all the equipment fastened to the floor of the dinghy. Two factors have delayed the development of this type of equipment: (1) Contractors were reluctant to alter designs of the container to make one large enough to stow both the dinghy and equipment, and (2) inflation of the dinghy might be impeded by the additional weight of emergency gear.

The first step was the enlargement of stowages, or containers, for the dinghies of the Lancaster and Halifax. In this design all the equipment was lashed to the dinghy stowage lid, which was attached to the dinghy by a lanyard.

After tests on the Lancaster, it was found possible to pack the "Q" Dinghy and the crew equipment to the floor of the raft in the desired manner. This method has been officially adopted. At present a series of similar tests are being conducted on the proposed enlarged stowage for the Halifax. The problem in this case has been more difficult, and final tests are being conducted on a suggested modification.

It is now an established policy that in the future all new British dinghy installations shall be such that the dinghy, when ejected from its container, shall emerge with all the equipment securely fastened to the floor. Dinghy stowages of new types of aircraft have already been designed to meet this policy.

ling Kit Suggested By Rescue Unit In Combat Area Adopted

ned pilot's best contact with s is by the use of signaling s difficult for rescue craft to t of the survivor's position nally sighting him. A signal- opted by the Air Sea Rescue in San Francisco from the of a rescue squadron in one bat areas, makes this contact The purpose of the kit is to survivor with sufficient signaling equipment for all atmospheric and sea conditions in order that the survivor may continuously and effectively make his presence known to searching parties.

The waterproof canvas kit contains three packages of life jacket dye marker, two white smoke grenades, one grenade holder and clamp, signaling mirror, police whistle, a distress signal kit containing pyrotechnic projector and six Very's cartridges, and a waterproof one-cell flashlight. The 7×7×9-inch container is closed at the top by an 8-inch zipper. A 30-foot drift line is attached to help the survivor retrieve the kit after it has been dropped.

The buoyant container has been test dropped successfully from a PBM at 300 feet at 100 knots IAS. On the second drop all items were found serviceable and intact. The tests were conducted at high speed and altitude.

Additional Type of Equipment Received for Exhibit

(2 October to 31 October 1944)

Catalogue No.	Object	Source
44.266.1-6	Bag, vinylite; for water (6)	U. S. N., BuAer, Washington, D. C.
44.267.1	Light, electric, attachable	Do.
44.268.1	Reflector, RESTRICTED	M. I. T., Cambridge, Mass.
44.269.1.1-4	Parachute flare, Mark 4, Mod. 5 (Inert).	Naval Ammunition Depot, Crane, Ind.
44.269.2.1-4	Parachute flare, Mark 5, Mod. 7 (Inert).	Do.
44.269.3.1-2	Aircraft flare, Mark 6, Mod. 4 (Inert).	Do.
44.269.4.1-2	Aircraft flare, Mark 8, Mod. 1 (Inert).	Do.
44.270.1-2.1-5	Charts, life raft, AAF (5 to set) (2)	Wright Field, Dayton, Ohio.
44.270.3-4.1-3	Scriptures: Protestant, Catholic, Jewish (2).	Do.
44.271.1.1-2	Fuze, flare, mechanical time, M111A2	AAF Technical Service Command, Wright Field, Dayton, Ohio.
44.271.2	Signal, Aircraft, red star, Parachute M11 (Inert).	Do.
44.271.3	Signal, Drift M25 (x-1c) (wooden dummy).	Do.
44.272.1	Flotation raft for Stokes litter	International Latex Corp., Playtex Park, Dover, Del.
44.273.1-16	Ration kit, Aircraft droppable ADR-1.	U. S. N., BuAer, Washington, D. C.
44.274.1-24	Signaling Kit, Aircraft droppable ADS-1.	Do.
44.275.1-2	Suit, exposure, Mk-1, Contr. N-288-S-25990.	Do.
44.276.1-71	Aircraft shipwreck kit, M-594B	Do.

Organization in AAF fo Developing Survival and Rescue Gear Is Describe

The Emergency Rescue Branch, Personal Equipme ratory of the Air Technical Service Command at Wrig is charged with the responsibility for the development gency, rescue, and survival equipment used by the A Forces, in operations over water, desert, tropic, ar regions. This equipment includes all types of pneur rafts, life preserver vests, droppable rescue gear, the lifeboat, and rescue, sustenance, and survival kits. sonnel assigned to the Laboratory are selected in possessing both a background of actual experience ar tion which qualifies them for the decisions which a sary in the development of items of emergency equipn

New items of equipment are constantly under dev as are improvements and modifications in existin Ideas or requirements for development are receiv combat organizations, manufacturers, and other i personnel as well as from members within the la New ideas or modifications are tested experimenta samples have been fabricated locally or by manuf The samples of equipment are then submitted to Proving Ground Command for service test. The repo ing these service tests are reviewed by the AAF B recommendations are made to the Assistant Chief of for Operations, Commitments, and Requirements.

The Assistant Chief of Air Staff, Matériel and Servi directs that standardization, procurement, supply ar bution be accomplished by the Air Technical Serv mand. The Emergency Rescue Branch, Personal E Laboratory, then provides necessary drawings, spec and other pertinent information for procurement an nance.

PUBLICATIONS RECEIVED (*Continued from page 26*)

Mayday (*RESTRICTED*).

Memorandum presents in detail the emergency rescue plan of the Fourth Air Force. It first describes in general communications, organization, and plans of procedure; secondly, it describes the specific duties and responsibilities of each individual concerned. Charts portray main communication facilities available to the Fourth Air Force; coverages for VHF radios; HF net covering entire West Coast; operational, administrative and typical base organization for emergency rescue; rescue boat stations and coverages, and areas of responsibility for control groups.

SOURCE: *Mayday.* Fourth Air Force Emergency Rescue Memorandum No. 57-1. San Francisco, Calif., Headquarters Fourth Air Force, 18 July 1944.

WATER WEASEL (*Continued from page 27*)

and Development, the Ordnance Department, and the vehicles' manufacturer, Studebaker Corporation.

In addition to its use as a rescue vehicle for men in inaccessible swamp and mud areas such as are found in the Everglades of Florida, the "Water Weasel" has proved its value in the evacuation of wounded through mud in combat areas where other means of transportation have failed and for the past several months it has been successfully and enthusiastically used for the transportation of necessary supplies.

Procurement of the "Water Weasel" is underway by the Ordnance Department of the Army Service Forces. Other services of the Army and Navy are at present conducting tests on the vehicle.

BOOK REVIEW

(*Continued from page 26*)

Chapters are broken down i venient sections preceded by outlines, which readily ena reader to find information o food, shelter, clothing, healt lems, climate, transportation, mal life cycles and habitats.

The author explodes numer monly accepted "southern" id cerning Arctic living. Not among these is his discussion o

The only illustrations in the book are those depicting the con of snowhouses.

This work was first prepared upon request from the Army A and only a limited number o were made available. Because requests, the Army granted pe for Macmillan to print the cor edition.

A SURVIVAL ACCOUNT—

Rescue From Ice Cap

he five-man crew who bailed
the Himalayan Range and
rtained by the natives of
med and forbidden Shangrila,
up actually flew into the Lost
ıen they discovered that their
crunching across the slope
ɜenland Ice Cap rather than
ɔugh the thick, low-hanging
e.

ıe's engines were undamaged
ioman sent out the estimated
f the crash landing imme-
ıd simultaneously all energies
ınto play to rescue the seven
men. Those in the party in-

g) R. W. Shepard, pilot.
g) A. H. Gilster, copilot.
n V. Egert, aviation pilot 2/c.
Rutkowski, aviation radioman

Richey, aviation machinist's
:e 2/c.
Herbert, aviation radioman

lankenship, aviation machin-
ɜ mate 3/c.

ful rescues on the Arctic Ice
been effected before and since
ɜnt, but each has its own story
ination to live, its special ob-
ıd hazards, and its unique
roblems and survival tech-
ıich offer valuable experience
e rescues. Fortunately, this
crash landed on the smooth
cap which did much to pre-
ıus injury to the crew mem-
addition, it came down along
rd side of the slope which
lerably warmer than the wind
ɔs of the mountains or the
leys below. Even when the
ave out, the auxiliary motor
kept working so the survivors
municate with the rescue ship.
ɜne of the crash was 35 air
ım the nearest civilization.
ibility of landing a plane
with skis on the cap to take
rew was impractical because
ɔrt take-off area and the pre-
oftness of the glacier; and
f flying the downed plane out
possible since it kept sinking
ce and the engines froze.
ɔrtest, and most direct route
ıe of the crash involved cross-

ing a 600-foot icy fjord along the shore, through a narrow valley bounded by three 1,000-foot peaks, and over six glaciers to the smooth ice running up the slope. While the rescue party was making preparations for this treacherous journey, provided the weather permitted, planes dropped food, clothing, medical supplies, and machinery for the survivors' sustenance until they could be walked out. The Coast Guard cutter which was in direct communication with the 93–P–22, anchored along the fjord, and the rescue group scaled the steep precipice and established a base camp in the narrow valley on the other side.

FROST PROBLEM

The heavy frost which formed on the interior of the plane was one of the primary problems of the survivors. This is an inevitable situation inside inadequately heated and poorly ventilated habitation in the Arctic because the damp air from body heat and human breath fails to evaporate and thus freezes or forms frost. Sufficient ventilation permits the moist air to pass off but this would mean a choice of freezing to death or suffering from the discomforts of accumulative frost. Stoves were dropped to the plane, but did not provide adequate heat, and in addition, added the danger of suffocation from carbon monoxide. The men met the problem as well as possible under the circumstances by insulating the plane with parachutes, cardboard, and blankets. They took the other personal precautionary measures of providing ventilation and performing a minimum of activity to reduce the amount of damp air caused by body moisture.

SIXTEEN DAYS

The men who crashed were stranded on the cap for 16 days and were safely "home" on the eighteenth day. Logs kept by Shepard and Gilster of the survivors and Lt. R. H. Smith, who was present at the point from which rescue operations were directed, show the ingenuity and unexhausted efforts to save the lives of these men.

First Day.

When the weather over the ice cap closed in almost completely the 93–P–22 reversed course and headed for base. Six minutes later it mushed into a slope on the ice cap. Position was sent, engines were undamaged and kept running for communication purposes. Efforts to move the plane with the aid of engines and crew failed. The weather was poor, visibility zero, ceiling zero, snow falling. Heaters were not working.

Noon chow was one cup of chicken soup per man. Due to the altitude, efforts to hard-boil eggs on an electric plate for a "rainy day" failed. Army and Navy rations aboard were ample for the flight, but had to be rationed in the event that assistance might be delayed. In the afternoon engines were cut and the auxiliary power unit (the "put-put") was set up for communication work. Efforts were made at the base to send dropped equipment by B–25's but weather prevented their take-off. Meanwhile, plans were taking shape for the organization of a searching party.

As nightfall approached on the cap the snow continued to fall and the wind increased. There were four bunks and nine sleeping bags in the plane for the seven-man crew. Two sacks were put in each bunk. Three-man watches were established. Communications with the base were continued through the night. There was anxiety about the "put-put" fumes, so hatches were opened despite the cold. Bodies were warm enough except feet.

Second Day.

TENDER 25 MILES DISTANT

The plane was perched at an angle in landing and for this reason was uncomfortable for living purposes. So the crew turned to in an unsuccessful effort to level it and policed the interior to make of it the best camp possible. Meanwhile, a sea-plane tender, 25 air miles distant, was established as the operation center for a rescue party afoot which was to mount the cap, establish a base camp, and strike a trail to the plane.

The 93–P–22 requested goggles and snowshoes as snow continued lightly and the wind dropped. There was no visibility until late afternoon when it picked up to about three miles.

Noon chow was an orange, an egg, bread, and butter. The crew cleaned the snow off the plane so that it might be spotted from the air. Fear of perspiring precluded strenuous work. No change of clothing was available. One parachute was used for an engine cover since there was still hope of flying the plane off the cap. One engine was frozen. Another parachute was ripped up for rags and handkerchiefs. Asparagus soup, condensed milk, and bacon was supper chow. During the night the temperature dropped further and watches huddled in the navigation compartment for warmth. Weather still too bad for relief plans.

Third Day.

Wind was high, but the weather was clear. Smudge fires were lit and two B–25's came over and dropped at least 25 bundles of food, clothing, drink, radios, and other necessities. Morale was boosted 1,000 percent. There were sandwiches of steaks dropped by the B–25's for lunch.

Frost, caused by body heat and human breath, appeared on the interior of the plane. Possibility of flying the plane off the cap began to appear doubtful. The practice of off-coming watches preparing coffee for the group getting up was started. Ground rescue by the planes began to take shape with the combined services of Army, Navy, and Coast Guard personnel and civilians.

Fourth Day.

PLANES DROP STOVES

Herbert's ear was frozen during the day and one of the blisters burst. It was treated with burn ointment (all that was available) and bandaged. Stoves dropped by B–25's helped during the night. They didn't give off much heat, but the noise they made helped psychologically. Sleeping was more comfortable. The B–25's came over again and dropped excellent sleeping bags and more food. Cargo 'chutes were used for insulating the plane and covering the catwalks to keep feet off the cold metal deck. The "put-put," which had been out, was repaired with parts dropped by the B–25. More steaks were dropped and there were more steak sandwiches for chow. Sleeping was more comfortable in newly acquired clothing and with the additional sleeping bags.

At the base use of dog teams and sledges by the ground party was being considered, and inquiries came by radio as to what gear would be required to prepare the plane for flight off the cap.

Fifth Day.

At the base another Coast Guard vessel had been called in and dogs and sledges had been procured. At the plane, after a breakfast on K rations, the men went about the difficult gathering of bundles which had been dropped and still remained outside. The work was slow and tiring. The men carried the items to the plane from the surrounding heavily crevassed area. Several fell through up to their shoulders, and had it not been for the rope chain the falls might have been fatal.

There was still difficulty in keeping feet warm and dry, and more and more frost was gathering inside the plane. The night was the coldest yet, with the temperature dropping to —22° C. Bouillon soup was drunk from used bean cans in the effort to keep warm.

Sixth day.

From the rescue base the scouting party advanced and arrangements were made by radio to try signals. Still clinging to the idea that the plane might be salvaged, arrangements were made by the base to send block and tackle and other necessary gear. At the plane, Lieutenant (jg) Gilster awakened sick. Frost coating on inside of the plane now was about one-fourth inch thick. Discomfort from frost became worse and it melted when the sun shone. Radio equipment and sleeping bags were also covered with ice. The wind was too strong to put up a tent outside and the snow was too crumbly to make blocks for an ice house.

FOOD AND MUKLUKS

The weather cleared in the afternoon, and a B–25 came over and dropped more food, salvaging gear for the plane, engine heater, mukluks, and heavy socks. This drop rounded out camp supplies, and the mukluks and socks were found to be a tremendous improvement. They kept the feet warm and dry.

There was stew for dinner apple for dessert. An effort to start a smoke signal for t party which was trying to the best route over the glacie on the ice cap. The attempt successful, due primarily to of the extreme cold on the had become like tar, and to winds.

Seventh Day.

The "put-put" went out and during the night. Two hours required for repairing. It w that the engine heater had be beyond repair as it parted cargo chute in the drop. Zinc among the items dropped, and plied to the frostbitten ear it w to be much better than the b ment from the plane's first There was another salvage gea the afternoon and the crew wer trying to level the plane's w lower the floats. Some imp was made in the angle at w plane was resting, but otherwi not moved to any advantage.

Rutowski, the radioman, with heaves, chills, and stom had to be sacked in. The went out again, the battery and the crew was unable to g the portable receiver which dropped. It was severely cold night generally was the wors ence on the cap thus far.

Eighth Day.

The wind built up to 40 kn bursts up to 64 by midnight. was still miserable and it was as to what should be done The "put-put" finally was again. Lieutenant (jg) Gilste cuperated to some extent from and Rutowski felt better afte some soup. However, Egert, pilot, and Richey, the aviation ist mate, were sacked in—Ric a bad cough. The plane's gun was fired with the hop would be useful for the resc in taking bearing. Also a rounds were fired from the Ve

Ninth Day.

RESCUE PARTY CAM

The rescue party made ba lacking only the dogs, sledges,

he crew was informed as to
l be salvaged from the plane
would be destroyed in the
as abandoned and requested
whether surface conditions
ait take-off.

id Richey were feeling bet-
rind was still high, but there
ts that it might abate about
base had advised that the
ty might try to get through
the weather permitted. At
all hopes of flying it off the
en abandoned, and the crew
ed to walking off. The men
hink of shower baths, tooth
air brushes, and razors, but
r did not clear. Food was no
oblem because of the abund-
ped from the plane. The
as warmer, the temperature
nbed to —8° C. Word came
g teams were to arrive at the
glacier tomorrow (Friday)
ie rescue party would attempt
gain 2 days hence.

y.

i were in good spirits and be-
g a parody they worked up to
of "Swing Low, Sweet

ut-put" was giving trouble
snowfall was heavy with a
cast, visibility about 1 mile.
ew turned to, squaring away
be taken with them. Snow-
e prepared.

Day.

vas blowing about 25 to 30
n the east and snow was fly-
uding all possibility of the
rty getting through on this
wind later mounted to 45
l the plane was rocking as
were on a rolling sea, but the
re remained fairly high at

Day.

nd had stopped, but it was
ng. There was word from the
the rescue party had been re-
hip. The men at the plane did
what was up, but spirits drop-
e again when the sky cleared
ernoon. Morale reached new
n word came at midnight that
was returning again. This
ond cutter took over rescue
work while the other went out on another rescue mission.

Thirteenth Day.

The base radioed that, weather permitting, the rescue party would attempt to get through on the following day and suggested a constant oil fire signal. The plane advised the base that an amphibious landing was inadvisable with drifting snow and slopes precluding take-off. At the plane the early morning skies were clear and northern lights were brilliant and the temperature at —9° C. Another engine heater was dropped and the base was informed there was no need to send more equipment designed to aid in flying the plane out. At midnight a message from the rescue ship said the party was coming in on the following day.

Fourteenth Day.

TIME TO REJOICE

Snow drifts made scouting the area impossible. Communications from the base indicated the body was crossing the glacier to its northern side and then would ascend to the cap. On the plane word was received at 1100 that the party had been under way since 0915. The rescue party was sighted 6 miles distant to the southwest at 1327. It reached the plane at 1528 amid much rejoicing.

A meal of bouillon soup, steak, and beans was given the party, and then all hands except the watches sacked in. Men in the party included:

Lt. Stanley J. Paciorek, "B" 424th CA (AA).
Hans Seivers.
Neils Jensen.
Thyge Johansen.
Sinclair Adams.

They had made the 15-mile trip in 6 hours and 20 minutes with large back pads. Due to terrain dog sledges could not be used, so the rescue party moved in on skis. They reported the roughest part of the trip back would be at the end crossing over six glaciers and finally climbing 400 feet up a mountain and sliding down the other side on the seat of their pants to the camp. Adams attempted to take pictures but the camera froze after three shots of the plane. Radio equipment was smashed and classified gear, equipment and papers, destroyed by fire. The remains were covered with snow.

Fifteenth Day.

WALKING BACK

Reveille at 0600; departure from plane at 0837. The walk in was described as "one of the most exhausting and horrible experiences of their lives," but members of the party said, "No one has ever seen such a happy, tired group of fellows in their lives." Adams, Egert, and Gilster were out in front. The trip back was uneventful for the first 3 hours. Then the crew began to feel the soreness and it was more and more of an effort to move snowshoes over snow frosted and then crusted. Adams, Egert, and Gilster crossed seven glaciers instead of six and therefore walked 2 miles out of their way. By the time they returned to the trail the entire party was all together including Johansen and Jensen who had left the plane 2 hours after the main body of the party.

The glaciers were difficult and negotiating them was slow. Finally the mountain was climbed over jagged rocks and the sit-down slide down the other side was described as the most comfortable part of the journey. Members of the plane crew said what the rescue party "didn't go through to get us is really something. It is surprising that they were able to find a passage through to clear ice in the time they did. They did a marvelous job, to put it mildly." Outside of fatigue and foot blisters the entire party made the trip in good condition. It had been 10 hours between breakfast and chow at the tent camp and warm food was as welcome as was sleep on the pine deck.

Sixteenth Day.

The day was started after 13 hours of sleep. Camp was broken at 1027 and the party was alongside the rescue vessel at 1158. The last leg of the journey required easing their way down the rocks to the fjord with the aid of a 1-inch line. The crew marveled at how the rescue party with all of its gear mounted the 600-foot cliff taking with them two 400-pound motor sleds—which were not used because they had no traction across the ice.

A new, tougher, braided fishing line may go into emergency kits carried by men forced down at sea (*Tech Talk*, Air Force, October 1944).

U. S. GOVERNMENT PRINTING OFFICE: 1944

COMMITTEES FOR AIR SEA RESCUE

1. Committee to Study the Preparation of Emergency and Survival Publications.
   (A. Chm) CG: Lt. J. H. Bell, USCGR[1] ADams 2003 1516 14th St. NW.
   Army: Capt. Thomas Dunn, AC[1], Army 73538 Room 4E 144 Pentagon
   Alt: Maj. K. O. Bennington, Army 74687 AC[1], Room 4E 144 Pentagon
   Navy: Lt. Norville W. White, USNR, Navy 4038 2W30 Bg–W.

2. Committee to Study Adequacy of Air Sea Rescue Facilities.
   (Chm) CG: Comdr. A. E. Harned, ADams 2003 USCG, 1516 14th St. NW.
   Army: Maj. T. J. Borgman, Army 73538 AC, 4E 144 Pentagon.
   Alt: Maj. William J. Small, Army 73538 AC[1], 4E 144 Pentagon.
   Navy: Lt. C. W. Brown, USNR, Navy 61178 Corcoran Annex, Rm. 305.

3. Committee to Study the Communication Facilities and Requirements for Air Sea Rescue.
   (Chm) CG: Capt. E. M. Webster, Navy 4444 USCG, Rm. 7300 CG HQ.
   Army: Capt. J. M. Sherman, AC, Army 4847 4E 144 Pentagon.
   Alt: Maj. T. J. Borgman, AC[1], Army 73538 Rm. 4E 144 Pentagon.
   Navy: Comdr. C. L. Harding, Navy 63636 USCG, Room 2541 Navy Bldg.

4. Committee to Study Special Aircraft Equipment for Rescue and Survival.
   (Chm) CG: Lt. Comdr. J. D. McCubbin, USCG, 1516 14th St. NW. ADams 2003
   Army: Capt. Wilfred Hines, AC[1], Army 74687 4E 144 Pentagon.
   Alt: Capt. Knute Flint, AC[1], Army 4847 4E 144 Pentagon.
   Navy: Lt. (jg) R. J. Willingham, Navy 4038 USNR, 2W32 Bg–W.

5. Committee to Study Primary Life Saving Equipment on Heavily Loaded Transports.
   (Chm) CG: Comdr. R. A. Smyth, Navy 4374 USCGR, Room 5316 CG HQ.
   Army: Major P. P. Fenwick, Arm TC, 3C 738 Pentagon.
   Navy: Lt. Comdr. J. L. Caillouet, Navy Jr., USNR, T4–2903.

6. Committee to Study the Medical and Physiological of Air Sea Rescue.
   CG: Sr. Surgeon Paul A., Neal, WIsc USPHS, National Institute of Health, Bethesda, Md.
   Army: Maj. Frederick Fink, M. C. Army ASF, Room 421, 1818 H St. NW.
   Chief, Medical Safety Division[1], Office of Flying Safety, HQ, AAF, Winston-Salem, N. C.
   Alt: Major Richard Follis, MC,[1] Asst. Chief, Medical Safety Div., Office of Flying Safety, HQ, AAF, Winston-Salem, N. C.
   Navy: Capt. John H. Korb (MC), Navy USN, Room 28 PotAnn Bg–3.
   (Chm) Lt. Comdr. C. F. Gell Navy (MC), USN, Room 2906 Navy Dept.
   RAF: Wing Comdr. P. O. Lee, DE 9 1424 16th St. NW.

7. Committee to Study Ditching Procedures.
   (A. Chm) CG: Comdr. A. E. Harned, ADan USCG, 1516 14th St. NW.
   Army: Maj K. O. Bennington, Army AC, 4E 144 Pentagon.
   Alt: Capt. Thomas Dunn, AC[1], Army 4E 144 Pentagon.
   Navy: Comdr. Harry R. Horney, USN, Room 1802, Navy Navy Bldg.
   RAF: Wing Comdr. R. Bicknell, 1424 16th St. NW. DE 9

[1] These officers have not yet been approved by th for Air Sea Rescue.

AIR SEA RESCUE AGENCY

R. R. WAESCHE, Vice Admiral
U. S. Coast Guard

W. A. BURTON, Commander, USCG
Executive Assistant to Head of Air Sea Rescue Agency

BOARD FOR AIR SEA RESCUE

C. V. WHITNEY, *Colonel*, U. S. Army Air Forces
J. W. BURGARD, *Lieutenant Colonel*, U. S. Army Air Forces
W. J. RENN, *Lieutenant Colonel*, U. S. Army Service Forces
J. W. HARRIS, *Captain*, U. S. Navy
PAUL FOLEY, JR., *Commander*, U. S. Navy

SPECIAL DUTY STAFF OFFICERS, AIR SEA RESCUE AGENCY:
COMDR. A. C. HOHN (MC) USN.
MAJ. C. M. MURPHY, AC, ATC, Army of United States
CAPT. RUSSELL E. PIERCE, USMC (R)
LT. E. J. SANGER, USNR

CONTENTS

Communications to Air Sea Rescue Bulletin should be addressed:

AIR SEA RESCUE BULLETIN
AIR SEA RESCUE AGENCY
1516 Fourteenth Street, N. W.
Washington, D. C.

ORGANIZATION

AIR SEA RESCUE FACILITIES

Establishment of Air Sea Rescue facilities in United States sea frontiers, coordinating with Army activities, has been authorized by the Commander-in-Chief, U. S. Fleet, and Chief of Naval Operations. These facilities are distinct from the over-all coordinating and development functions of the Air Sea Rescue Agency. Authorization for their establishment covers organizational measures to be taken, development of suitable methods and procedures including centralized control, and the furnishing of required operational units, primarily by the Coast Guard.

The letter by Admiral E. J. King authorizing establishment of the facilities follows:

25 August 1944.

From: Commander-in-Chief, United States Fleet, and Chief of Naval Operations.

To: Commander Western Sea Frontier. Commander Eastern Sea Frontier. Commander Gulf Sea Frontier. Commandant, United States Coast Guard.

Subject: Air Sea Rescue.

1. It is desired that the necessary organizational measures be taken to establish in the sea frontiers addressed adequate Air Sea Rescue facilities, and to develop suitable methods and procedures therefore, including centralized control.

2. Existing sea frontier facilities, including operations centers, communication facilities, radar, radio compass, etc., will be used to the maximum in establishing the Air Sea Rescue organization. Required operational units (air squadrons, rescue craft, and supporting facilities) will be furnished primarily by the Coast Guard.

3. Sea frontier commanders coordinating with the Commandant of the Coast Guard will prepare the necessary plans and estimates of requirements for effecting the establishment of the organization outlined above.

4. Due consideration will be taken of the necessity for coordinating the activities of the Air Sea Rescue organization with other Army and Navy air activities within the sea frontiers. The Army Air Forces will continue to participate in Air Sea Rescue until such time as the responsibility for the provision and control of Air Sea Rescue facilities adequate to cover all operations may have been placed upon one service.

5. The organization contemplated will not interfere with the provision of local crash or rescue facilities attached to air stations or air bases.

E. J. KING.

JOINT AGREEMENTS (COAST

By Fourth Air Force, Western Sea Front Civil Aeronautics Administration

An example of cooperation between the service Sea Rescue work was effected recently by the follow agreements entered into between the Fourth Air For ern Sea Frontier, and the Civil Aeronautics Admini

(*a*) That all rescue facilities and equipment wl be required, regardless of the service to wl belong, will be utilized in rendering assi aircraft in distress.

(*b*) That immediate interchange of information the respective Army Regional Control Cen the Western Sea Frontier Sector Joint O Centers be effected concerning all aircraft or crashes, regardless of any local action ta

(*c*) That the respective Army and Navy contr duty decide on the spot what service will ta on the particular incident in question, an joint action is considered necessary, the ex nature of such mutual assistance will be at once by the two controllers.

(*d*) That the Commanding General, Fourth Air F Commander Western Sea Frontier delegate sector and control group commanders aut act in the coordination of necessary Air Se operations.

(*e*) That the Fourth Air Force has the predo interest and responsibility for taking the in coordinating all search and rescue facil procedures over land, and that the Wes Frontier has the same predominating inte responsibility for taking the initiative for c ing all search and rescue facilities and pi over the sea.

RERUN OF AUGUST BULLETIN IN SEPTEMBER

This issue of the AIR SEA RESCUE BULLETIN is No. 4, and it is dated October 1944. Those addressees who are keeping files of the Bulletin will note that while the numbers are consecutive, an issue for September does not appear. This opportunity is taken to explain that the lapse between August and October was caused by the necessity to rerun the August issue to meet demands fo ditional copies of the No. 3 Bull

The second run of the August i (No. 3) was substituted for the tember AIR SEA RESCUE BULLETI

ANDPLANE DITCHING *Manual Prepared*

The following is taken from lplane Ditching Staff Instruc- ual" prepared by the Air Sea Agency Committee to Study Procedures. Contents of the ill be printed in two editions R SEA RESCUE BULLETIN. The on, which appears in this edi- tains information valuable to tors. The second portion, eristics of Aircraft Which De- Ditching Stations," applies o those interested in design t.]

NTRODUCTION

nal or forced landings on air- landplane pilot has a smooth, surface upon which to land. of a seaplane has to adjust ng technique to the varying s of the water upon which his specially designed to alight. sea surface becomes broken, ves, and swell conditions have en into consideration in de- the direction of approach and ique of putting the plane on . This choice may be compli- the fact that the waves and running in different directions. increases, likewise the prob- ding a seaplane becomes more ntil such time that the size akes a landing dangerous. zing that seaplanes sometimes sly damaged in spite of being or water landings, the extent blems associated with ditch- dplane in similar conditions reatly appreciated. This is mplicated by the fact that a pilot is not normally trained landings; his first ditching, may be his first experience of ling which makes it a much ult task to execute success- dangers are further in- the fact that the landplane is ed for water landings, al- ne attempt is made to lessen able hydrodynamic character- is indeed remarkable that so s do survive ditching and are spite of the fact that the y lack power or be damaged. ditching may be expected only ewmen have understanding plete situation.

It seems important, therefore, to consider the conditions which face the ditching pilot before we study design features which materially affect ditching procedures. The elementary definition of sea conditions must be clearly understood.

WAVES

Waves are an undulating movement of the surface moving in the same direction as the wind (except close in shore or in fast running estuaries). The actual mass of water in a wave does not move in a horizontal direction, except for tidal movement and breaking crests, while the surface particles circulate in an elliptical form. As the wind force increases, the waves become larger until the top of the wave approaches the vertical and breaks. The wind, depth of water, and area affect the distance between waves and their shape. If a tidal stream is running against the wave movement, the seas become shorter and steep.

The roughness of the sea is an indication of the strength of the wind, provided it has been blowing at the same velocity in the same direction for some time. Furthermore, this "roughness" is also an indication of the size of waves.

The indications are as follows:

WIND AND SEA PREDICTION TABLE

Velocity (knots)	Height of sea (feet)	Surface condition
0	0	Smooth slick sea.
2	0	Small occasional ripples.
3-4	½	Small ripples all over—no calm areas.
5-6	1	Well defined waves—smooth with no breaking.
7-9	2	Occasional whitecaps.
10-11	3	Pronounced waves, frequent whitecaps which carry a short distance.
12-13	4	Whitecaps close together, carrying over a distance equal to the wave height, slight traces of wind streaks.
14-16	5	Clearly defined wind streaks whose lengths are becoming equal to about 10 wave lengths. Light flurry patches.
17-19	7-8	Long well-defined streaks, waves and streaks coming from same direction.
20-22	9-10	Streaks are long and straight; whitecaps on every crest; wind picks up and carries mist along; large waves.
23-26	11-14	Large seas; with waves forming on them; wind picks up and carries occasional wave crest.
27-30	15-21	Heavy seas; pronounced white streaks; wind picks up frequent wave crests and carries along; breaking, rolling waves are forming.
31-37	23	Continual rolling waves; wind carries along all wave crests for a distance equal to ½ wave length; suds or foam streaks.
38-43	25-30	Well-defined foam on the heavy seas; suds or foam streaks; waves and seas breaking and rolling.

The wind will be stronger than the appearance of the sea suggests if it is freshening, blowing off a nearby shore, or with the tide or swell. Waves will be flattened during heavy rain.

Breaking waves may be due to shallow water and in such circumstances must not be used as a wind force calculator.

SWELL

A swell is an undulating movement of the surface caused by past or distant wind disturbances. Swells do not necessarily move with the wind and have no breaking crest except where a shallow bottom builds up a vertical face which will break. If the wind is blowing across the swell, a cross sea is created with the downwind moving waves running on the swell. The depth of water, wave conditions on the swell, and tidal stream are some of the factors which influence the swell size, apart from the wind force which created them.

MENTAL CONDITION

The mental condition imposed upon the pilot should be taken into consideration. Often he has been flying some hours before he is faced with the task of ditching and his aircraft is usually not under full control; his crew may be wounded or passengers of low physical standard; or it may be, and probably is, his first ditching. Such conditions require the highest qualities of skill in handling the aircraft and instructing the crew who depend very largely upon him for their continued existence. Add darkness and a rough sea to such conditions and all will agree that the pilot is indeed tried to the limit. Yet it has been done successfully—quite often.

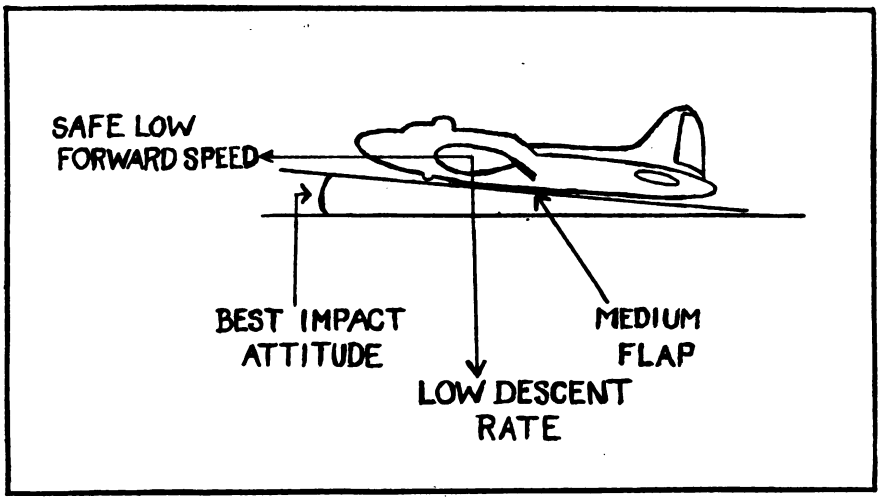


ILLUSTRATION 1.

VISIBILITY AND JUDGMENT OF HEIGHT

Restricted visibility obviously has a direct bearing upon the pilot's judgment. The varying conditions of the water's surface, including reflections from sky conditions, and the absence of land make judgment of height and estimation of the wave and swell movement difficult. Flat calm and muddy water conditions also make accurate judgment difficult.

HANDLING OF THE LANDPLANE IN DITCHING

From the foregoing remarks and because of the normal landplane's unfavorable hydrodynamic characteristics, the pilot must so handle the aircraft that he "lets it down gently" and do all in his power not to fly straight into a swell or wave face. (See ill. 1.)

The following prime factors must therefore be met:

1. Low forward speed.
2. Low rate of descent consistent with safe handling.
3. Good control at the best nose up attitude of impact.
4. The best compromise in choice of approach direction in relation to the waves and/or swell and wind.

USE OF FLAPS

The flaps should be lowered in order to reduce both the forward and vertical speeds at which the aircraft can approach. A medium setting is recommended. In general, if the flaps are lowered beyond the medium setting comparatively little reduction in forward speed is permissible while the rate of descent is increased and the aircraft approaches in a more nose-down attitude. If the nose is low at such a moment the impact will be violent. On the other hand, it will require more height and keen judgment to flatten out from such an attitude.

There are exceptions to this statement. Most Navy carrier-based fighters have comparatively large flaps which enable the pilot to make a relatively slow approach. This advantage is so great in this particular type of aircraft that full flap is advocated. The second exception is the B-24 Liberator. Here the flaps are so small relatively that almost no reduction in forward speed is obtained when the flaps are lowered to the medium setting. Full flap is recommended with this type of aircraft. Evidence indicates that the water impact on flaps causes no appreciable diving tendency with the possible exception of dive brakes and very strong flaps.

APPROACH WITHOUT POWER

When approaching without power, a greater than normal approach speed should be used. This excess speed has a twofold advantage:

1. It insures good control and some margin of speed after flattening out to allow the pilot to study the seas in order to choose the best point of impact in relation to surface conditions.

2. It aids the pilot not to c error of stalling in from to height.

APPROACH WITH I

If one engine of a two-engi is available, a little power used to flatten the approach; the engine should not be used extent that the aircraft cannot against it right down to the s margin of rudder movement On no account should the opened up during the final ditching. The power that ca will depend on the characteris type of aircraft and on som may be inadvisable to use the all.

If two engines are availat side of a four-engine aircraft, engine only should be used. U engines generally makes cont aircraft too difficult for ditching.

If the inner port and outer engines of a four-engine ai available, it will be possible t siderable power and adjusting tle so that little rudder is ne case approximates that in the below.

If power is available symme should be used with two engi four, in order to secure the fl sible approach path and th possible landing speed.

The use of power in ditchin portant that when it is certai coast cannot be reached, the p if possible ditch before fuel i hausted.

If symmetrical power is not a slightly higher than normal proach speed should be used. mentioned previously, will in control and some margin of s flattening out to allow the choose the best point of impa tion to surface conditions.

Apart from choosing the co of impact, the pilot should e hold off until all reserve speed stall is lost so that the impact the three-point wheel landin or the slow landing (nose wh ground) attitude for tricycles.

When ditching by moonli direction of approach is no surface conditions, it is advan ditch in a direction that place about 30° on the port bow.

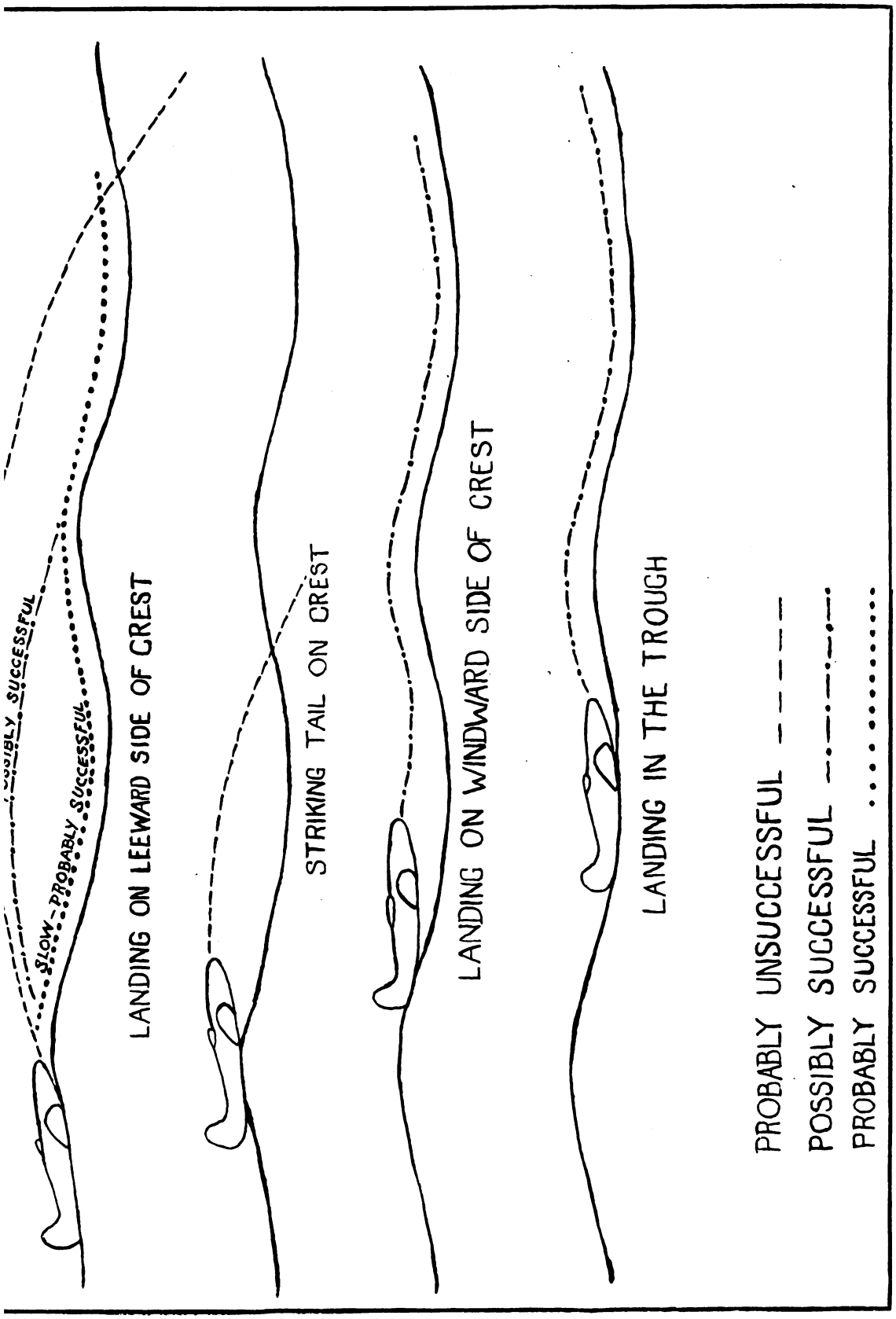


ILLUSTRATION 2.

CHOICE OF APPROACH DIRECTION

In choosing the direction of approach the height and distance apart of waves and swell in relation to the aircraft size is all important.

If a pilot ever has the opportunity of going at 35 knots in a high-speed launch, he will be amply impressed by the might of the sea and the damage it can inflict even on a boat. It should also be noted that the surface craft is traveling only at half the aircraft's lowest possible impact speed.

As previously stated, judgment of sea conditions from the air is not easy. It always looks more calm than it really is. Furthermore, it is always difficult to judge just how the waves are running in relation to swell. But the pilot, if he knows the wind speed and direction, can have forewarning of the wave conditions. It should be understood that swell conditions may complicate this rule.

A cut-and-dried ditching technique has not yet been instilled into all pilots. The best advise for the landplane pilot is to become familiar with the sea by flying low over the surface to watch wave and swell movements. From such study, the pilot should make his own choice.

Illustration 2, taken from an original report by D. C. MacPhail and J. C. Ross of the Royal Aircraft Establishment, shows clearly the possibilities of into-wind ditching. Upon studying this diagram, it will be appreciated that the execution of such a ditching calls for accurate judgment.

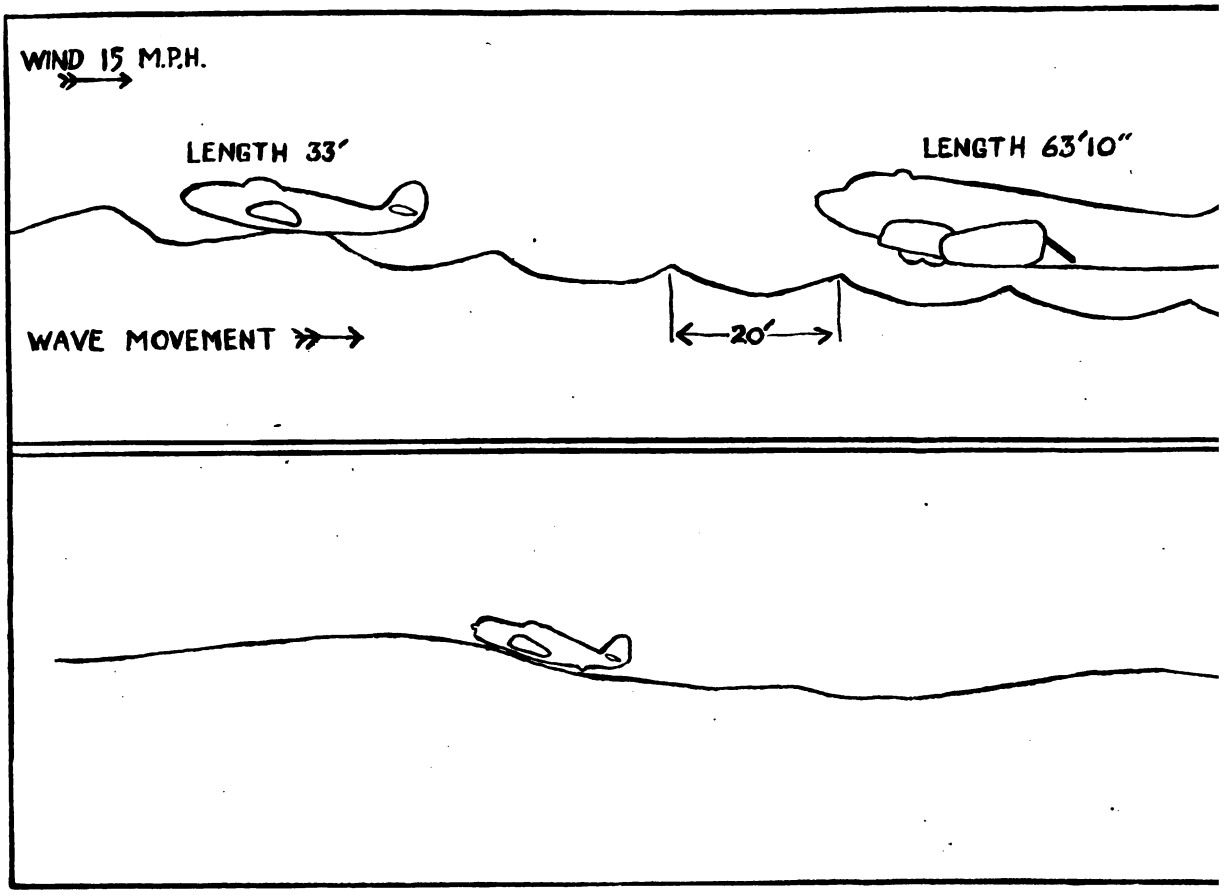


ILLUSTRATION 3.

The C–47 would fare far better than the F6F Hellcat when ditching into wind because of the distance between crests for the C–47 is three wave crests within its own length, whereas the Hellcat only covers one-and-one-half waves. (See ill. 3.) Consequently the fighter is far more likely to dive. In such circumstances, the F6F Hellcat should be ditched crosswind and the C–47 would ditch better that way also, although it may survive ditching into the wind in waves of the size illustrated.

In illustration 3 a single-seated fighter is shown about to ditch into the wind near the top of an unruffled ocean swell which is running into the v is obviously the best cours this swell were running wi which caused waves of dai mensions, ditching crosswinc pear the best course, unless is so strong that the ground be greatly reduced. In the C–47 the distance between is not sufficiently great to into-wind ditching and tl shown ditching crosswind swell and waves. (See ill. 4

Where waves *and* swell the pilot must choose which appears to be the less forn he is able, he may choose a approach which is a compror waves and swell.

It will be seen from the Sea Prediction Table (p. 4 wind of 12 to 13 knots the v is four feet. Such seas wo a hazard to a fighter but l heavy bomber. Any seas g four-foot waves present a ser to all landplanes which atter across them.

However, there are adva

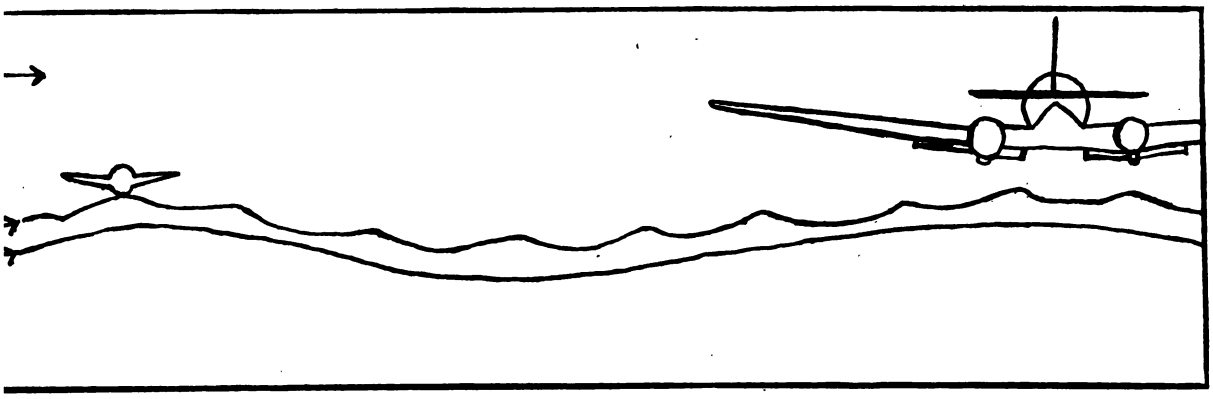


ILLUSTRATION 4.

high winds. As the wind
:he distance between wave
hens, thus allowing the pilot
ortunity for selecting a more
spot on the wave for the
act. Also an increase of
ts a decrease in ground speed
ig into the wind.
ssary to point out that in a
condition whatever the dis-
en wave crests or whatever
in into the wind ditching is
because the impact speed is
uced by reason of the high
urally where an aircraft's
ed is low, into wind ditching
e frequently preferable ow-
even lower ground speed

words, if the pilot commits
ditching into wind across
he commits himself to two
vantages. In the first place,
straight into a wave face,
the tail may bounce on a
crest causing the nose to be thrown violently downward.

LANDING CROSSWIND

When it is decided to ditch crosswind or along the swells adopt the following technique:

1. Obtain the lowest rate of descent and forward speed made possible by use of flap and power if available.
2. Maintain the most advantageous nose up attitude of impact made possible by medium of flap and power.
3. Compensate drift by heading.
4. Endeavor to land on the downwind side of the swell top or wave crest.
5. In multi-engined aircraft that side of the aircraft which has maximum power available should be the upwind side, providing this does not involve a low turn near the water. (See ill. 5.)

LANDING INTO WIND

When it is decided to ditch into wind across waves adopt the following technique:

1. Obtain the lowest possible rate of descent. This is important because the relative rate of descent may be increased due to the impact occuring on a rising crest.
2. Obtain the lowest possible forward speed. This is important because the nose may strike a wave face. If the speed is low the impact will be less severe. Also at high speed if the tail strikes a crest pitching will be more violent.
3. Maintain the most advantageous nose up attitude thereby avoiding as far as possible the nose striking a wave face.
4. Endeavor to touch down just before a rising wave face.
5. Endeavor to hold the nose up until all speed is lost.

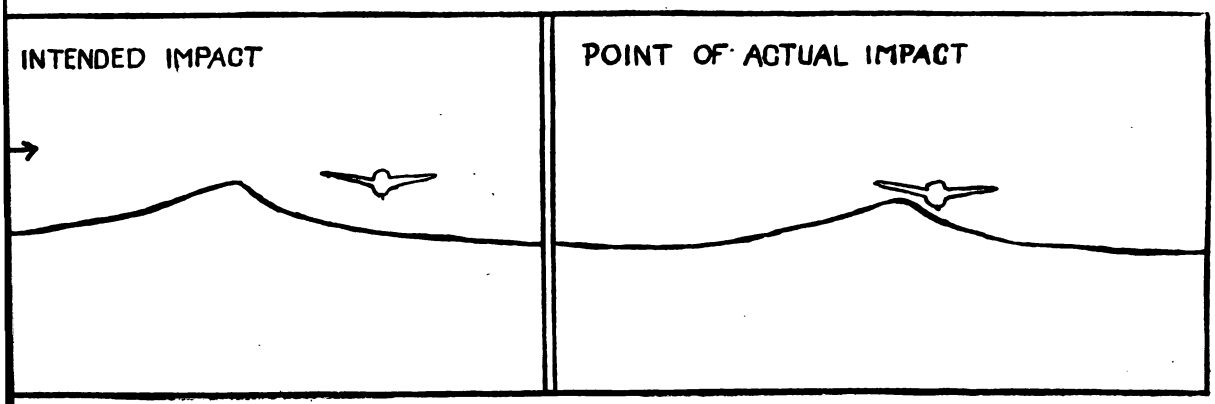


ILLUSTRATION 5.

EQUIPMENT AND FACILITIES

United States Army Air Forces, Navy, and British Develop

AIRBORNE LIFEBOAT

Versions To Be Dropped From Operational Aircraft

Airborne boats have been adopted by both the Army Air Forces and the Navy for expediting rescue operations. The boats may be dropped by operational aircraft to men downed near enemy waters or in regions where rescues by surface vessels and amphibious aircraft could not be carried out with safety, in waters too rough to land seaplanes, or places too distant to be reached by surface craft or naval vessels. The droppable boats are equipped with motors to enable the survivors to proceed under power to either friendly land or waters less hazardous where rescue might be more readily effected.

The Army and Navy have developed different versions of airborne boats required to conform to peculiarities of the types of aircraft available to the respective services for carrying the boats. The Air Force craft, Airborne Lifeboat, type A–1, is a 27-foot mahogany molded plywood sailing vessel with two inboard motors and sufficient food and water for a crew of twelve men to navigate for about 5 weeks. This boat is suspended under the fuselage of a B–17 aircraft.

The Navy AR–10 Rescue Assembly is especially designed for drops from carrier-based aircraft. This compact, nonrigid pneumatic boat with emergency equipment, outboard motor, and fuel packaged in five separate containers, is carried in the bomb bay of a TBF "Avenger." The rubber boat accommodates ten men, has sufficient fuel for a 50-mile journey under power, and, in addition, is equipped with a mast and sails.

BRITISH AIRBORNE LIFEBOAT

The idea of an airborne lifeboat was originated by an internationally known British boatsman, Mr. Uffa Fox. In 1941 Mr. Fox presented his proposal to Lord Brabazon of Tara, then the Minister of Aircraft Production in England, for dropping a lifeboat from the air by parachute. At the same time Group Captain E. F. Waring, Deputy Director of Air Sea Rescue, Air Ministry, made similar proposals Few were better qualified to design such a boat than Uffa Fox, who had designed, built, and mastered nearly every type of craft, from the canoe to the yacht—an individual who had crossed the Atlantic in 60-foot, 40-foot, and 36-foot boats—the author of 8 or 10 very excellent and well-known books on the subject of small boats.

On May 5, 1943, the British Airborne Lifeboat, Mark I, was dropped operationally for the first time to an astounded crew of a plane forced to ditch off the Dutch coast. The second drop was made off the French coast on July 20, 1943. A Wellington returning from a night bombing mission over western Europe was damaged by flak. Oil began to leak from the port engine causing the pressure to drop immediately. The battered plane, flying at 4,000 feet over antiaircraft batteries along the French coast, headed for the open sea to ditch. The home base was notified that the ship was returning and as the French coast was approached the transmitter key was clamped down. The plane ditched at 0210 hours approximately 26 miles west of Cap de La Hève.

All six crew members boarded their dinghy, but they suffered from seasickness during the first night. On the morning of the sixth day, the crew had drifted east-south-east within sight of the enemy-held coast. To avoid drifting ashore, a long struggle with paddles began. At noon that day they were sighted by a fighter plane approximately 15 miles west of Le Havre. In spite of all their efforts to head north, the dinghy was drifting dangerously near the coast till they were only 7 miles off the coastline north of Le Havre. The plane had established a fix for the distressed crew so the following day a Hudson, with adequate fighter escort, appeared carrying an airborne lifeboat. The crew cast out sea dye marker and fired signal flares to indicate the direction of the wind. The drop was made at an airspeed of 120 miles per hour from an altitude of 700 feet. The lifeboat alighted upwind of the crew because it was dropped too late, but with vigorous paddling the dinghy crew soon came alongside.

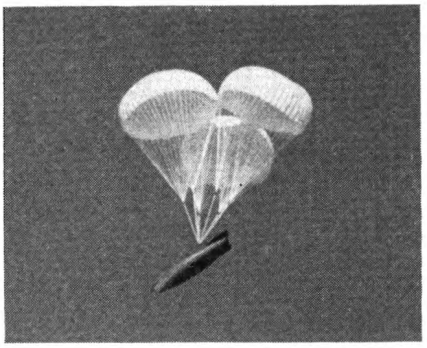
The crew had seen air diagrams of the lifeboat, and had read leases of its first rescue, but never seen the instructions They boarded the craft with immediately performed the getting under way described structions. It was decided the proximity to enemy insta proceed under power to the the English Channel and the remainder of the way. Afte 30 miles at an average spe knots, they were intercepte H. S. L.'s. The one boat took aboard to return them to b the second vessel took the tow. It was estimated that i had not been intercepted t have reached the eastern proaches within 6 hours if continued under power.

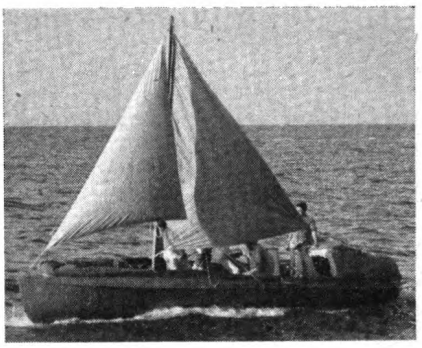
Although the rescue was ingly successful, there we functional faults in the drop inexperienced dinghy crew overcame, and which have rected by modification of proper instruction to loadi crews. The rocket drogue the boat during the descent righting chambers failed to rear canvas cover was split leased from the bomb bay, parachute failed to release cally when the lifeboat wa the water.

Since then many successf have been carried out by dro boat to downed air crews in Sea, English Channel, and Bay

THREE 32-FOO PARACHUTES

The original airborne lifeb I, is suspended under the fus Hudson. The double skin boat has an "all-up" weight mately 1,600 pounds, is 23 fee 5½ feet beam, has a maxin of 6½ knots, and a maximu 100 miles at 4 knots on one 60 miles at 6 knots on bot The boat is designed and eq seven men.





foot parachutes, rather than canopy, are used to drop e boat in order to check during the descent. The the water at a 30° to 40° automatic release gear dis- parachutes as soon as the es waterborne. During the the boat assumes an angle iately 40° a rocket is fired by a level switch which ogue, or sea anchor, which he boat's head to the wind its drift in the water. lso two rockets which cast f buoyant rope in opposite rom each side of the boat oat is level in the water. a length of about 350 yards h the distressed crew may is especially helpful when and rough seas block the dinghy crew.

ighting feature of the air- is the inflatable chambers at l aft ends of the boat. The ibes are inflated by a CO_2 ich is activated as the boat lane. Thus, upon reaching these pneumatic V-shaped de buoyancy, and in the oat capsizes will turn it in osition. In addition to the ly inflated bags, inter- es along the sides are topped llows and serve to prevent coming aboard and also e craft stable when heeling

MENT FOR BOAT AND MEN

oment carried may be di- ly into two types—that for navigation of the boat, and owed in lockers which is r the use of the crew. The eight watertight compart-

Equipment carried includes:

Quantity:	*Item*
1	Battery.
10½ gallons	Fuel.
3 gallons	Oil.
4	Rowlocks.
4	Oars.
2	Britannia Middy Motors.
1 set	Mast and sails.
1	Rudder and tiller.
1	Compass.
1 set	Charts.
1	Chart board with waterproof cover.
3	Pencils for use with chart board.
2 sets	Leak stoppers.
1	Topping-up bellows.
1	Boat repair mat.
1	Engine tool kit.
1	Bilge pump.
1	Radio set, T.1333.
1	Radio receiver.
1	Rocket launched kite aerial complete.
1	Auxiliary whip aerial.
1	Signaling lamp.
2	Filament lamps.
1	Signaling pistol in tin box.
54	Signaling cartridges in tin box.
4	Dinghy smoke floats.
1	Waterproof flashlight.
28 cans	Condensed milk.
7	Emergency flying rations.
49 cans	Drinking water.
3	Drinking cups.
1	First-aid kit.
14	Everhot bags.
1 pint	Massage oil.
7	Outer suits (seamen's protective suits).
7	Inner suits.
3 tins	Cigarettes.
3	Match containers with matches.
1 pack	Playing cards in waterproof pack.
1	Floating knife.
1	Instruction book.

Procedures for setting sail after the crew has boarded the lifeboat vary depending upon the circumstances; that is, after the parachutes have been released (if not completely cleared when the boat struck the water), when the rocket lines have been hauled and stowed, and after the side buoyancy bags have been inflated. If it is of supreme importance to get away from the area, both engines should be started immediately. If the distance to a friendly shore is within the fuel-range of the lifeboat (about 50 to 60 miles), both engines may be started and a course set with the intention of reaching home under power alone. However, if the distance "home" exceeds the cruising range of the boat, the mast and sail should be stepped as soon as possible.

Stowed, and marked plainly, in one of the lockers are simple, clear instructions for operating the boat under sails. Actual incidents show that the boat can be handled by a crew of untrained and inexperienced men.

Plans have been made for carrying the Mark I and Ia boats on the Warwick Rescue Aircraft. The British Air Ministry is at present conducting final tests on a 30-foot boat, the Mark II. It will accommodate 10 men, travel at a cruising speed of no less than 7 knots under power alone, and carry sufficient fuel for a 300-mile sea voyage.

AAF LIFEBOAT CARRIED ON B–17

In November 1943, Wing Commander R. Bicknell of the Deputy Directorate, Air Sea Rescue, Air Ministry, brought the line and arrangement drawings and sail plans of a 30-foot airborne lifeboat, plus a Mark Ia Airborne Lifeboat, to the United States. Development was immediately undertaken upon a directive from the Office of Commitments and Requirements of the U. S. Army Air Forces. Experimentation and research took place in the laboratories of the Emergency Rescue Unit, Matériel Command, at Wright Field.

The latest experimental model of the airborne lifeboat, as developed at Wright Field, has been successfully dropped from the B–17 aircraft a total of five times and has been sailed across the Gulf of Mexico for a total of 600 miles. During the sailing test a storm with winds up to 40 miles per hour and waves 20 feet in height were encountered without difficulty. The U. S. Airborne Lifeboat, Army Designation type A–1, Specification 40743, will be used

primarily for survivors afloat at sea as a result of a ditching or sinking.

The adopted boat is constructed of laminated mahogany plywood molded to give a hull thickness of five-eighths of an inch. It is 27 feet in length, 7½-foot beam, and has twenty watertight compartments. The weight of the lifeboat with equipment, parachutes, and fuel does not exceed 3,250 pounds. Similar to the British boat, it is equipped with carbon dioxide inflated self-righting chambers which prevent its capsizing in any weather. To avoid detection by enemy aircraft the boat is carefully camouflaged with blue to blend with the ocean. It is equipped with two air-cooled four-stroke engines which operate independently of each other.

Speed is 5 miles per hour under one engine and 8 miles per hour under both engines. Cruising range is 500 miles. It is equipped to transport 12 men, but as many as 36 men have been in the boat at one time.

The airborne boat is attached to the aircraft by four suspension cables running up to the standard bomb shackles. It is released by the mechanical bomb salvo lever which can be controlled by the bombardier or the pilot of the plane. When rescuing personnel the pilot flies into the wind at 1,500 feet with an air speed of 120 miles per hour and releases the boat when directly over the distressed crew. As the boat leaves the aircraft the parachutes are opened by means of a static line attached to the keel of the bomb bay catwalk. It descends into the water suspended by three standard Army 48-foot cargo parachutes. As the chutes develop the boat assumes a 50° bow-down attitude and descends at the rate of 25 feet a second. It enters the water at the 50° angle for about one-third of its length to reduce the impact force to a minimum. Upon striking the water, two 200-yard rocket projected side lines (adaptation from the British) eject from each side of the boat. The parachutes act as sea anchors to hold the boat in position so that it can be reached by the personnel .floating downwind directly to the position where the boat was dropped. Upon reaching the boat the crew follows the exact procedure outlined in an instructional booklet stowed in one of the lockers. The first step is to release the parachutes. Next, the engines are started, sails are hoisted and the crew gets under way. When the boat is dropped, the aircraft crew include a map of the area indicating the exact position of the crew adrift and the approximate course they should navigate. The sails are small in area with adequate reef points to facilitate handling of the boat by totally inexperienced crews. The elements of sailing and operation of a small boat in open sea are explained in detail in the instructional booklet.

AAF BOAT EQUIPMENT

Equipment of this boat includes:

Quantity:	*Item*
2	Aircooled engines, 5 horsepower.
1 set	Mast and sails.
2	Oars and rowlocks.
1	Tiller and rudder assembly.
1	Heaving quoit with line.
1	Log, taffrail.
1	Compass, flush deck.
1	Raincatcher.
1	Sea anchor.
1	Bucket, 10-quart.
1	Tool kit.
1	Bilge pump.
1	Logbook.
1	Waterproof chart case.
6	Pencils.
1	Sail repair kit.
8	Plastic cups.
1	Can opener.
1	Inflation pump.
1	Clock.
1	Fire extinguisher.
1 set	Hydrographic charts.
1	Instruction book.
2	*The Raft Book*—Gatty.
2	Sponges.
1 hank	Cord.
250	Matches.
2	Floating knives.
4	Air mattresses.
8	Blankets.
30	Two-star, red, hand-held pyrotechnic signals, Mark III.
2	Waterproof flashlight with bulbs and batteries.
1	Lamp assembly, flashlight.
10	Hand-held smoke distress signals.
3	Emergency signaling mirrors.
3 cans	Sea marker dye.
2	Police whistles.
1	Abandon ship kit.
2 units	Human blood plasma.
2	Sunburn protective ointment.
2	Engine saltwater stills.
30	Desalination kits.
30 cans	Drinking water.
6 bars	Saltwater soap.
12 pair	Socks.
12 pair	Underwear, drawers.
24	Undershirts.
24	Hats.
6	Rubberized suits.
2 pair	Rubber boots.
2	Wrist compasses.
3 cartons	Chewing gum.
20 cans	Cigarettes.
60 boxes	Breakfast (2 meals each).
60 boxes	Suppers (2 meals each).
20 tins	Life raft rations.

The boat is equipped with food, water, and clothing sufficient for transporting 12 survivors about 5 weeks across any navigable waters of the world. In addition to the water supply of drinking water and desalin the water ration may be su by using the heat of the engi to produce 2 gallons of disti for every gallon of fuel. Th head of the engine is used to h soup. The U. S. Signal C 578 radio, popularly known a son Girl," may be stowed i at the discretion of the loc rescue squadrons, depending use of radio in the particul of the mission.

It is anticipated that at boat will be stationed at each B–17's operate over water hand for immediate use to personnel at sea. The boat signed that it can be attac standard operational B–17 i of 60 minutes. The 60 min quired in order to remove bay doors of the aircraft and suspension cables to the bom of the plane.

The Higgins Industries, Inc leans, La., have been put u tract by the Army Air Forc procurement of 600 airborne Delivery was to commence on ber 1944, at the rate of 50 month.

NAVY AR–10

The Navy also regards airl as important in its rescue the choice in the type of airc able to carry a boat on its limited. As a matter of fac planes with the exception o used largely by the Marines, t the JM used for training, were Since the Navy Air Force is Navy turned first to develop small, compact, non-rigid boat be carried on the TBF plane aircraft carriers. As a res search and experimentation Rescue Assembly was desig dropped from the bomb bay c type aircraft. The equipm aged in five containers, incl man boat, 2 revised shipwre outboard motor, and a fuel with approximately 8 gallon line. The gear, dropped in tr together with 35 yards o line between each contain dropped, the time of the d controlled by the intervelom predetermined setting from a of approximately 100 feet speed of about 70 to 80 knot

(*Continued on p. 20*)

CTORS IN PYROTECHNICS VISIBILITY

S. War Department Technical Manual 9–1981)

cipal factors controlling the ss of pyrotechnics are design, ıd atmospheric conditions.

of design include candlepower, degree of separation of the composite signal (blinker, chain).

of position include height at flare or signal functions, dis- observer from signal, distance m objective to be illuminated, l, and relative position of tive, and observer.

eric conditions include clarity ere, time (day or night), pres- e, fog, dust, rain, or snow, and nd brightness of the sky.

ility of signals and illuminat- of flares depends primarily dlepower of the pyrotechnic though there are minor varia- mposition and density, there to the amount of light pro- a given weight of candle. ıort thick candle will give ımination for a shorter time ıg thin candle of the same ıich will burn for a longer less brilliance.

COLOR FACTORS

ı in the visibility of signals r is due to the following two

greater sensitivity of the eyes the middle of the spectrum, yellow and its neighbors, orange; and the greater abil- onger light waves (reds and penetrate haze and fog.

r and texture of an objective amount of light reflected by sequently, its visibility. For ırren ground, such as an air- s three or four times as much ods or deep water and needs ıation.

can be seen much farther ıttern can be distinguished. of 2 miles or more, the var- of such signals as chains or nd into each other, giving the of a single spot of light. In ost colors fade or otherwise long range. Consequently, chain signals are apt to be od at distances greater than in the daytime or 2 miles at

The closer a flare is to an objective, the greater will be the illumination and, hence, the greater the visibility, provided the flare is not so close to the line of vision as to blind the observer by its glare.

A flare above and behind the observer illuminates nearby objects well but is useless for long range observation.

A flare midway between the observer and objective loses effectiveness due to the distance its light must travel to the objective and back to the observer.

A flare placed behind the objective and almost in line of vision is useful in silhouetting the objective, especially when the atmosphere is slightly hazy.

BACKGROUND AND VISIBILITY

Backgrounds which offer contrast in color or brightness increase visibility; noncontrasting backgrounds materially reduce it.

Although light is diffused in all directions from an unpolished object, the maximum amount of light is reflected according to the same principle as that of a mirror. The angle at which the light leaves the reflecting surface is equal to the angle at which it strikes; this angle of observation will consequently give maximum visibility.

PYROTECHNICS' USE GUIDE

Particles of dust, moisture, or smoke in the air materially reduce visibility. All colors are affected, but reds and yellows less so than the greens and blues. Heavy fog, snow, or rain will totally obscure the light from pyrotechnics at distances so short as to make their use impractical. Sky background and direction alter color and distinctiveness materially, for example, looking toward the sun.

The following table will serve as a guide in the use of pyrotechnics. This table is based on a fixed distance. *Variation due to distance should be calculated by the use of the inverse square law.*

Candlepower of colored light necessary for visibility at 5,000 yards:

Atmospheric conditions	Red	Amber	White	Green
Night, clear	1. 0	2. 0	2. 5	2.'8
Night, rain, light	1. 2	2. 1	3. 0	3. 2
Night, overcast and haze	3. 2	4. 1	3. 1	5. 9
Night, rain, heavy	8. 9	33. 5	132. 0	33. 5
Night, snow, light	222. 0	835. 0	1, 556. 0	567. 0
Day, overcast and haze	2, 000. 0	2, 111. 0	3, 222. 0	4, 000. 0
Day, clear	4, 778. 0	7, 556. 0	11, 111. 0	10, 000. 0

Distances at which, under average weather conditions, the various type of signals may be recognized are governed by the following considerations. Signals may be seen at greater distances but, due to the tendency of colors to change with distance and the tendency of several lights to merge into one, reliable recognition of the TYPE of signal should not be expected at distances notably greater than 1,500 yards in DAYTIME, or 2 miles at NIGHT.

British Revise Desalination Kit

A new version of the W. P. R. B. (Water Pollution Research Board) kit, a chemical process for desalination of sea water, is now in production.

A description of the use and operation of the earlier model appeared in the June issue of the AIR SEA RESCUE BULLETIN. The new kit will be inclosed in a plastic container the same dimensions as the original container and will carry nine briquets which will yield approximately 5½ Imperial pints of potable water. The weight of the complete kit will be 2 pounds and the amount of water produced one-half that of the first model. The second container, pump, and filter papers have been removed, thus simplifying the operation. The principle of the operation of the kit is similar to the Navy-Permutit system of kneading the briquet and sea water in a flexible bag, and drawing the drinking water through a filter and tube at the bottom of the bag.

NEW LIFE PRESERVER CONSERVES KAI

A prospective shortage of kapok has stimulated efforts to conserve the present supply of kapok and to provide acceptable substitutes in quantity. The situation caused the War Production Board to issue Order M–85, dated 22 May 1944, limiting the use of kapok to life vests, life jackets and collars.

Designs of life preservers have been modified and new designs prepared aimed at using kapok to the best advantage. These designs also incorporate special features permitting the laundering of life preservers without affecting the kapok in the removable pads. Kapok, under suitable restrictions, is being reclaimed and used to replace a certain proportion of new kapok in the manufacture of preservers. The Foreign Economic Administration is arranging for purchase of kapok from sources not previously furnishing material acceptable for use in life preservers. Technical assistance from the Services will insure that any material obtained from these sources is suitable for life preserver use.

Investigations are under way in England, in Canada, and by various agencies in this country, aiming at the production of an acceptable substitute in quantity. Among these may be mentioned the activities of the War Production Board and the Department of Agriculture in the stimulation of the production of milkweed floss. Research investigation of all buoyant fibers is under way at Vanderbilt University. Another research project on development of a synthetic buoyant material as a substitute for kapok in the manufacture of life preservers recently has been initiated at the Mellon Institute by the National Research Council at request of the Air Sea Rescue Agency.

A NEW LIFE PRESERVER

Meanwhile, in line with these efforts, a new life preserver designed to conserve critical kapok, developed through the Air Sea Rescue Agency, has been approved by the United States Coast Guard.

While kapok conservation was the principal objective of those working on the new preserver, it also embodies improvements in flotation and fit characteristics, features a body strap for hoisting unconscious wearers, and it is adapted for use with rubber lifesaving suits. These features are among those specified in designs, approved by the Coast Guard on the following models:

1. Coast Guard adult kapok life preserver Model 1 (CG drawing No. F–49–6–1, sheets 1 and 2, and specification dated June 10, 1944) (20 to 21 ounces kapok, removable pads enclosed within vinylite covering) (for general use).

2. Coast Guard adult kapok life preserver, Model 2 (CG drawing No. F–49–6–1, sheets 1 and 2, and specification dated June 10, 1944) (20 to 21 ounces kapok, removable pads not enclosed within vinylite covering) (for general use).

3. Coast Guard adult kapok life preserver, Model 3 (CG drawing No. F–49–6–1, sheets 1 and 2, and specification dated June 10, 1944) (23 to 24 ounces kapok, removable pads enclosed within vinylite covering) (for use with lifesaving suits).

Approval of these designs was reported in the Federal Register June 21, 1944.

Application for patent covering the design of the life preserver is filed in the name of R. E. Coombs, USCGR, inventor, and assignment of the invention to the Government of the United States has been made by Captain Coombs.

The simplicity and ruggedness of the new life preserver is said to result generally in improvement over kapok preservers now in use. It is the consensus of the subcommittee working with Captain Coombs that the models with 20 to 21 ounces of kapok should be recommended, to the services involved, as a standard life preserver for general use in all ocean and coastwise service for the duration of the war, and that those with 23 to 24 ounces of kapok should be recommended for use with rubber lifesaving suits used by Merchant Marine personnel. The subcommittee is aware, however, that this style of life preserver would not be suitable for all types of service. For example, it would not be suitable for soldiers engaged in invasion actions.

KAPOK PADS REMOVABLE

Officially designated as "Life preserver, kapok (jacket type) Style ASRA–10," the life preserver consists essentially of a vest-cut envelope containing pockets in which are enclosed pads of buoyant material. The envelope is fitted with tapes to provid reversibility and proper adjus close fit to adult bodies of var Flotation characteristics ar rated into the design so that t is held in an upright positi water, but at a slightly backw with head and face above th

Removable kapok pads ar permitting the use of kapok from damaged or soiled jack feature allows for removal o for laundering covers when come soiled (which may be desirable in cases where th troop transport use).

The new life preserver, a submerged 48 hours in fresh v ported the following net weig

Life preserver with 20 ounces ka
Life preserver with 24 ounces ka

The principle of subdividing pads is incorporated in order optimum buoyancy under all of service.

Reversibility and adjustm complished by enclosing t drawstrings across the back i so that when the tapes are p jacket gathers across the ba snug fit around the waist resu held closely to the body of t by the body strap webbing w its double D ring fastening ment, provides fastening and justment in one pull of the w

The jacket does not ride wearer, when properly adjuste of the close fit around the complished by pulling and crossed drawstrings and the across the chest achieved by p body strip tight.

The jacket is reinforced by ¾-inch tape at critical point around the back of the collar, ings for the body strap reve ture, and the drawstrin openings.

The body strap may be used ing from the water a wearer v weakened or unconscious cor

A tab provided on the left for easy attachment of the life light.

The life preserver (Models suitable for use in conjunc rubber lifesaving suits as w general purposes, but the n taining 23 to 24 ounces of

r recommended for use with lifesaving suits, whereas the taining 20 to 21 ounces of uitable for general use with-saving suits.

lope is to be not more than one piece for either side, seams and stitching. Three e formed for insertion of . The two front pads are from the envelope when por-

tions of the lower longitudinal seam are open and the back pad is removable when a portion of the armhole seam is open.

DESIGNED FOR SUBSTITUTES

The kapok pads are formed from two pieces of material which are stitched in a manner to allow welting with kapok distributed as follows:

DISTRIBUTION OF KAPOK IN PAD INSERTS

	Type 1 life preserver		Type 2 life preserver		Type 3 life preserver	
	Min. (oz.)	Max. (oz.)	Min. (oz.)	Max. (oz.)	Min. (oz.)	Max. (oz.)
pok	20	21	20	21	23	24
ion	4¾	5	4¾	5	5½	5¾
ion	2¾	3	2¾	3	3¼	3½
	4¾	5	4¾	5	5½	5¾

gn of the life preserver is if kapok were no longer ther material might be in- into the pockets for buoy- out further changing the l design of the jacket.

ervation of kapok and man- removable pad inserts are th vinylite coated fabric, heat-sealed tight in a man- to the construction of the avy kapok life jacket. It is ed that certain classes of ht better utilize this design server without vinylite pad nd provision was so made cifications. It was recom- that the pads with or with- covering, properly secured used by the War Depart- of its successful experience ng Army life preservers.

aracteristic details of the ver follow:

apes at the neck extend not 4 inches from the edge of reserver and are stitched elope. The free ends are l stitched according to Fed- cations.

strings at the waist are 52 length and are secured in ing tunnel. The free ends l over and stitched in ac- with Federal specifications. r lifting strap is secured in rmed between two pieces of e. The outside edge of the ngs are 20 inches from the of the jacket. The other body strap is doubled over and stitched in accordance with Federal specifications.

The binding tape is stitched approximately 15 inches around the back of the neck and is stitched also around the openings for reversibility of the body strap and around the end-openings of the drawstring tunnel.

The tab for attachment of the life preserver light is securely stitched to the left shoulder. It is approximately 3½ inches cut length and the free end is doubled over and stitched according to Federal specifications.

The life preserver envelope or cover is of cotton drill, treated with an approved fire-resistive substance complying with Navy Department specifications.

The covering for the kapok pads is of unbleached cotton print cloth with a minimum breaking strength of 40 pounds in warp and 25 pounds in the filling.

FLAME RESISTANT COVERING

The outer covering for the kapok pads consists of a coated fabric possessing flame resistance and other characteristics specified by the Bureau of Ships, U. S. Navy.

The tie tapes at the neck and the lower drawstrings are 1¼-inch cotton tape identical in color to the treated drill jacket, weighing not less than 0.3 ounce per linear yard and having a minimum breaking strength of 200 pounds. The tie tapes and drawstrings are not treated with a fire-resistive substance.

The body strap is of 1-inch cotton webbing, olive drab or equivalent in color to the cotton drill covering, weighing not more than 1.5 ounces per linear yard and having a minimum breaking strength of 400 pounds.

The D rings are of steel, ends welded to form complete ring. They are galvanized or otherwise suitably protected against corrosion. When assembled, the complete body strap with D ring fastening arrangement has a breaking strength of not less than 360 pounds.

The tab for attachment of the life preserver light is of 1-inch cotton webbing identical to that for the hoisting strap.

The reinforcing tape is of ¾-inch cotton equivalent in color to the treated drill jacket covering, weighing not less than 0.18 ounce per linear yard and having a minimum breaking strength of 120 pounds. This cotton tape is treated with an approved fire-resistive substance complying with Navy specifications.

Work on this life preserver, including design and testing, was done by an Air Sea Rescue Agency committee on design and testing of life preservers. The action followed a conference of representatives of all interested services called December 16, 1943, by the Coordinator of Research and Development, United States Navy. Economic utilization of kapok in life preservers and the finding of acceptable substitutes were of immediate concern of those who sponsored the meeting.

MODEL AND TYPES TESTED

A subcommittee was formed to undertake the task of designing and constructing a life preserver which would permit economic use of kapok, allow easier reclamation of used kapok from surveyed life preservers, provide ready utilization of substitute buoyant materials which might be used if kapok were not available and devise other improvements over present type kapok life preserver. The subcommittee sought also the development of a life preserver which would be suitable for use with rubber lifesaving suits as well as for general use.

Recommendations were made after comparative tests between experimental models and models of other types of kapok life preservers including the

(*Continued on p. 19*)

Additional Types of Equipment Received for Exhibit

(May 14 to September 30, 1944)

Catalog number	Object	Source
44.168.1.1-4	Mirror, distress signaling, Sav-A-Life.	C. H. Wilson, Los Angeles, Calif.
44.170.1.1-11	Kit, fishing and sewing (for C-1 vest).	Matériel Command Wright Fields, Dayton, Ohio.
44.172.1.1-12	Pencils (12) for crash boats)	St. Louis Medical Depot, St. Louis, Mo.
44.173.1.1-5	Generator, Model LCPE-24F (Fighter pilot's rescue marker).	Lithaloys Corporation, New York, N. Y.
44.175.1.1-3	Markers "Taxiway" with Scotchlite (3).	Minnesota Mining & Mfg. Co., St. Paul, Minn.
44.178.1	Ration, Army Air Force, pocket individual operational (Strato Sweets).	U. S. Army Quartermaster Depot, Chicago, Ill.
44.181.1-10	Splints (2) with accessories (for crash boats).	Binghamton Medical Depot, Binghamton, N. Y.
44.185.1	Strap, litter securing (for crash boats).	Los Angeles Medical Depot, Los Angeles, Calif.
44.186.1-3	Sea anchors for pneumatic rafts (3).	AAF Supply Officer, Wright Field, Dayton, Ohio.
44.189.1-4.1-10	Kits, drinking water, Permutit, in water can type of container (4).	U. S. N., BuAer, Washington, D. C.
44.190.1-3	Ration U. S. Navy emergency life raft, Spec. NAVAER M-539b (3).	National Naval Medical Center, Bethesda, Md.
44.191.1	Tubing, luminous	John Mackler & Co., Chicago, Ill.
44.192.1-2.1-2	Lighters "Foxhole" (2)	Canadian Joint Staff, Washington, D. C. (Air Member's Office).
44.193.1.1-3	"Lifelite" Model A-3 (handmade).	Julian A. McDermott, Corporation, Elmhurst, N. Y.
44.194.1	Button strap, retroflective (plastic strap).	Continental Lithograph Corporation, Cleveland, Ohio.
44.196.1	Harness, survivor rescue	Air Sea Rescue Agency.
44.196.2-3.1-4 44.196.4-5.1-2	Suits, exposure, Naval EN-44, and cases (4).	B. F. Goodrich Co., Akron, Ohio.
44.199.1	Model, Liberty Ship, in glass case.	U. S. Maritime Commission, Department of Commerce Building, Washington, D. C.
44.200.1	Still, fuel, experimental (life raft).	Higgins Industries, Inc., New Orleans, La.
44.201.1-3	Fishing equipment, improvised hooks and lines, display boards (3).	Naval Aviation Training Division, Chapel Hill, N. C.
44.203.1-5	Sea markers (5)	NASD, Norfolk, Va.
44.205.1-45	Still, 10-gallon per hour, distillation unit, series D.	Higgins Industries, Inc., New Orleans, La.
44.206.1.1-7	Rude star finder and identifier, H. O. No. 21-02-B.	Hydrographic Office, Washington, D. C.
44.207.1.1-5	Still, solar, Model B-3, inflated type (experimental).	Gallowhur Chemical Corporation, New York, N. Y.
44.208.1	Signal, smoke, A. P., life jacket, Mark I, orange.	U. S. N., BuOrd, Washington, D. C.
44.209.1.1-23	Raft, life, one man parachute type, Spec. No. AN-R-2b.	Naval Air Station, Norfolk, Va.
	BRITISH EQUIPMENT, R. A. F.	
44.212.1-6	Cylinders, gas, CO2 (6) (6D/77, 6D/84, 6D/151, 6D/87, 6D/542, 6D/535).	United Kingdom (through British Air Commission, New York City).
44.212.7	Cover, weather apron, (27C/2035).	Do.
44.212.8.1-4	Mast, C/W guys, telescopic (27C/2067).	Do.
44.212.9-12	Heads, operating, CO_2 cylinders (6D/125, 6D/633, 6D/752, 6D/454) (4).	United King British Air New York
44.212.13.1	Container, Bircham supplying dropping (15B/82) (unopened; contents uncatalogued).	Do.
44.212.14	Pack, emergency, type 6 (27C/2094).	Do.
44.212.15	Signal, distress, 2 star red, MK. II.	Do.
44.212.16	Drogue, sea, small (27C/1890)	Do.
44.212.17	Cover, weather apron (27C/2034).	Do.
44.212.18	Marker, sea, fluorescent	Do.
44.212.19	Dinghy, type H, Mk. III (27D/1879).	Do.
44.212.20.1-8	Dinghy, single seater, type K (Fighter Pilot's, 27C/1899).	Do.
44.212.21	Dinghy, emergency, type M (27C/1916).	Do.
44.212.22.1-2	Covers, weather (27C/2036) (2)	Do.
44.212.23	Dinghy, type M (27C/1883)	Do.
44.212.24	Dinghy, type J, Mk. III (27C/1882).	Do.
44.212.25	Dinghy, type K (27C/1927)	Do.
44.212.26	Cover, weather apron (27C/2037).	Do.
44.212.27.1-6	Dinghy, type Q (27C/2065)	Do.
44.212.28.1-6	Dinghy, type D (27C/2115)	Do.
44.212.29.1-2	Dinghy, type L (27C/1897)	Do.
44.212.30	Water (drinking) (27P/8)	Do.
44.212.31	Torch, electric, waterproof Mk. II (5A/2910).	Do.
44.212.32	Inflator, breast type (27C/1880).	Do.
44.212.33.1-2	Mirror, heliograph (27C/2102)	Do.
44.212.34.1.1-2	Bag, "Ever-Hot" (22C/175)	Do.
44.212.35	Knife, floating (27C/2023)	Do.
44.212.36.1-9	Kit, repair, for dinghies (27C/1164).	Do.
44.212.37	Valise (27C/2066)	Do.
44.212.38	Pack, dinghy, type B (empty) (27C/1900).	Do.
44.212.39	Cup, drinking and bailer, graduated (27C/2033).	Do.
44.212.40	Whistle, air crew (23/230)	Do.
44.212.41	Bag, mast (27C/2091)	Do.
44.212.42	Bag, bellows (27C/2092)	Do.
44.212.43	Pistol, signal 1", No. 2 (Mk. V (7B971).	Do.
44.212.44	Head, operating, CO_2 cylinders, type B (6D/79).	Do.
44.212.45	Bag, felt (27C/2093)	Do.
44.212.46	Manometer (27C/1926)	Do.
44.212.47	Switch, immersion (6D/148)	Do.
44.212.48.1.1-2 44.212.48.2.1	Dinghy, Spitfire rescue (15B/92).	Do.

EQUIPMENT AND FACILITIES

er	Object	Source
---	Pump, hand, concertina type.	United Kingdom (through British Air Commission, New York City).
---	Line, 5′ 1½″	Do.
---	Line, in winding cylinder	Do.
---	Pack, dinghy, tropical, for type K dinghy (27C/2019).	Do.
---	Pack, dinghy, type C, for type K dinghy (27C/1920).	Do.
---	Pack, dinghy, type D, for type K dinghy (27C/2027).	Do.
---	Pack, dinghy, seat type "A," Mk. III, for type K dinghy (27C/2088).	Do.
---	Valise, for "C" or "M" dinghy (27C/1889).	Do.
---	Valise, for "H" type dinghy (27C/1893).	Do.
---	Valise, for Lindholme apparatus (15B/79).	Do.
---	Lindholme rescue dinghy apparatus (15B/71).	Do.
---	Inflator, dinghy, concertina type, British (27C/2083).	Do.
---	Pouch, to hold 3 signals (27C/2053).	Do.
---	Container, Nestor, waterproof, match (12D/460).	Do.
---	Rations, flying, Mark II (27P/7).	Do.
---	Stoppers, leak, nested (27C/1876) (3).	Do.
---	Stoppers, leak, small and medium (27C/1903).	Do.
---	Bailer, collapsible (27C/1902)	Do.
---	Case, for sail and mast (27C/2056).	Do.
---	Sleeve, protecting, for CO_2 cylinder (27C/2044).	Do.
---	Bag, sail (27C/2090)	Do.
---	Paddles, small, hand (27C/1906).	Do.
---	Unit, loading (aerial), type 6 (10B/1247).	Do.
---	Bulbs (2) (5L/1872, lamp filament).	Do.
---	Compass, magnetic, marching, Mark I (6E/374).	Do.
---	Head, operating, CO_2 cylinder, type G (6D/126).	Do.
---	Pack, emergency, type 3 (27C/1929).	Do.
---	Pack, emergency, type 5 (27C/1919).	Do.
---	Pack, emergency, type 4 (27C/1930).	Do.
---	Pack, emergency, type 7 (27C/1931).	Do.
---	Paddles, glove, drogue type (27C/1894) (2).	Do.
---	Thwart, wooden (27C)	Do.
---	Paddles, plastic (27C/1039) (2)	Do.
---	Pump, deflation, flotation (4G/1310).	Do.
---	Mainsail (27C/2069)	Do.
---	Foresail (27C/2068)	Do.
---	Rudder (27C/2070)	Do.
---	Kite, collapsible, Mk. II (incomplete) (51/162).	Do.
---	Aerial, mast, (10B/1162)	Do.

Catalog number	Object	Source
44. 212. 89	Sail, C/W mast, for one man pneumatic raft (27C/ 2055 and 27C/2054)	United Kingdom (through British Air Commission, New York City).
44. 213. 1–8. 1–9	Rations, lifeboat and life raft, Merchant Marine type, 8 cartons.	U. S. Maritime Commission, Washington, D. C.
44. 213. 9–42. 1–9	Water lifeboat and life raft, Merchant Marine type, 34 cartons.	Do.
44. 215. 1–6	Ration D, U. S. Army field (6).	O. Q. M. G., Washington, D. C.
44. 215. 7–12	Ration K, U. S. Army field (2 breakfast, 2 dinner, 2 supper—in new colored wrapping).	Do
44. 216. 1–3. 1–4 44. 216. 4. 1–3 44. 216. 5	"Var-Lite" sea sponge units (4).	The Varnition Co., Los Angeles, Calif.
44.216.6–18	"Var-Lite" grounds (3), light starter crystals (6), and paste (3).	The Varniton Co., Los Angeles, Calif.
44.216.19–21.1–2	Flags "Var-Lite" (3) and crystals (3).	Do.
44.217.1	Still, solar, for pneumatic life rafts (experimental), Higgins-Ushakoff model.	Higgins Industries, Inc., New Orleans, La.
44.220.1.1–	Kit, shipwreck (contents not catalogued).	Coast Guard Air Station San Diego, Calif.
44.220.2–7	Dye markers, fluorescein and aluminum powder (6).	Do.
44.221.1.1–24	Vest, emergency sustenance, type C–1.	Wright Field, Dayton, Ohio.
44.222.2	Projector, hand, Mk. IV	Navy Department, Washington, D. C.
44. 223.2.1–42	Raft, Navy, Mark IV, type D, Spec. M–3Q.	SO. Naval Air Station Anacostia, D. C.
44.224.1	Pemmican, Wilson's (experimental emergency ration).	Arctic, Desert, Tropic, Information Center, Washington, D. C.
44.227.5–16	Manuals (12) "Survival on Land and Sea."	BuAer, Washington, D. C.
44.228.1–4	Insect repellents (dimethyl phthalate) (3) and one copy of the Technical Bulletin TB MED 31.	War Dept. A. S. F., Office of the Surgeon General.
44.229.1.1–29	Kits, back pad Spec. M–592	Naval Aviation Supply Depot, Philadelphia, Pa.
44.230.1	Hat-headnet (new standard Navy) Spec. M565A.	BuAer, Washington, D. C.
44.231.1–2	Signals (2) daytime distress (dummies) VK M–1.	Van Karner Chemical Arms Corporation, Marine Signal Division, Port Jervis, N. Y.
44.231.3–4	Lights (2), red distress (dummies) VK M–2.	Do.
44.231.5–6	Lights, (2), blue pilot (dummies) VK M–3.	Do.
44.231.7–8	Signals-aircraft distress (2) (dummies) VK M–6.	Do.
44.231.9–10	Lights, green, distress (2) (dummies) V K M–7.	Do
44.231.11–12	Lights, white, distress (2) (dummies) V K M–7.	Do.
44.231.13	Parachute gun V K M–12	Do.
44.231.14.1–2	Parachute shell, and charge (parachute signal) V K M–12.	Do.
44.233.1	Stokes litter	Commander LeBlanc, Medical Section, U. S. C. G. Headquarters, Washington, D. C.
44.234.1–4	Fuel tablets, ration heating (4)	OQMG, Washington, D. C.

(Continued on Page 24)

USE OF EYES *At Night May Be Difference Between Life and Death*

Written for AIR SEA RESCUE BULLETIN by Lieut. Harry J. Older, H-V(S), USNR,
Aviation Psychology Section, Bureau of Medicine and Surgery, U. S. Navy

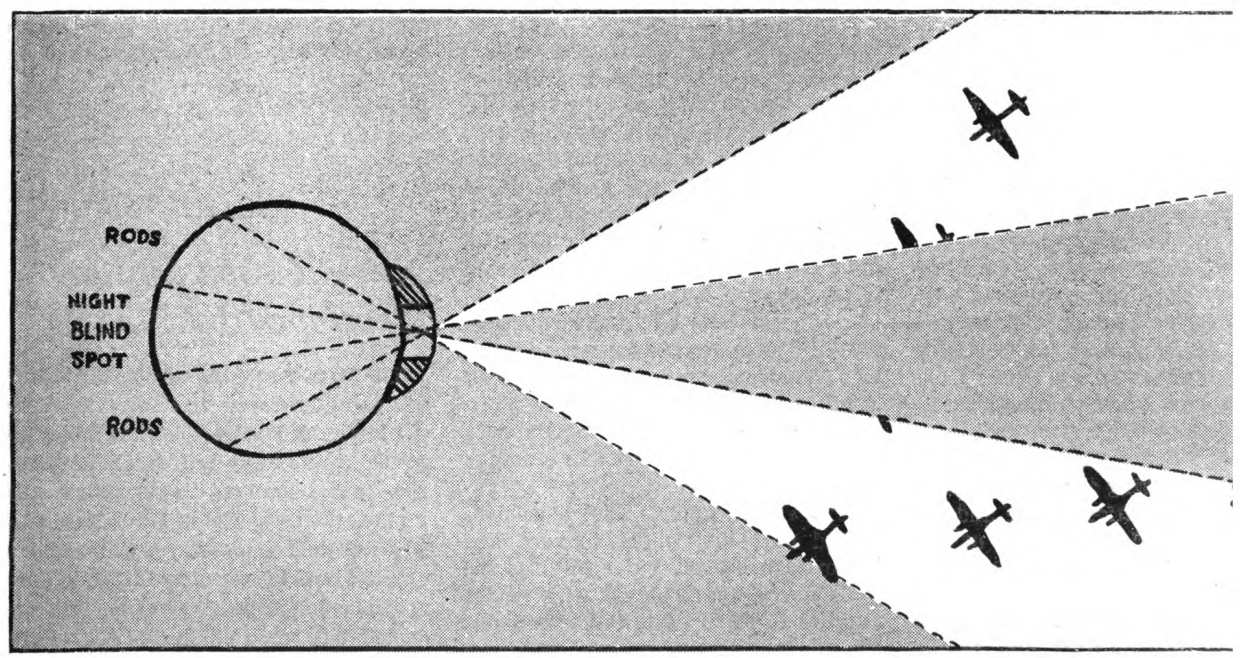
Survival in modern warfare depends on knowing all the tricks of the trade that may give the fighting man an edge over the enemy or the elements. The efficient use of the eyes at night is one of those extra skills which may mean the difference between life and death. It is particularly important in air-sea-rescue operations that no search plane ever miss the opportunity to rescue lost personnel simply because of lack of visual contact, if such contact is possible. Conversely, no one adrift and awaiting rescue should be so unfortunate as to miss seeing a rescuer that is in visual range.

There is no simple formula which will enable one to see in complete darkness; even nocturnal animals require some light to make their way around. However, there are some facts about the use of the eyes at night which will produce results that are frequently gratifying, and occasionally lifesaving. These facts should be known, as they apply to the special problems of air-sea rescue.

There are two separate mechanisms in the eye for day and night vision—the cones and the rods. Cones, which transmit daytime visual impressions, are located in and around the fovea at the back of the eye and are sensitive to light intensities varying from brightest daylight down to moonlight. For intensities below that of full moonlight, the rods must be brought into play, since only they are capable of registering impressions at these low levels of illumination. The rods are located in and around the center of the back of the eye, the greatest concentration being a few degrees from the fovea.

Everyone knows that when lights are suddenly turned off, there is a period of relative blindness lasting for a few minutes. This is followed by a longer period of getting used to the darkness. This process is generally misunderstood. The general belief is that the increased sensitivity is caused by the enlargement of the pupil. While this is in part responsible, it contributes only a small fraction of the total increased sensitivity which comes after prolonged darkness. A far more important reason is a chemical process which takes place. As a result of this chemical change, the threshold for dim light is gradually lowered (over a period of 30 minutes) to a point where one can perceive a light about one-millionth as bright as that which was just barely perceptible immediately following the plu darkness.

In daytime lighting condi most efficient way to see an to look straight at it. This i the cones, which transmit suc are located at the center of the the fovea at the back of the ey fore, the clearest view of an obtained when the image of t falls exactly on this centrall area. At night, however, the not able to handle the situatio rods must be used. Conseq order to make sure that the falling on a concentration of



necessary to fixate to the rig or above or below the object.

Another important peculiar rods is that they are relativel tive to red light (wave lengt 000 millimicrons). Dark a proceeds almost as rapidly subject is in red light as whe total darkness.

These are the basic facts w be considered when attempti information on the use of th night. Following, are their applications.

AL PROBLEMS OF SEARCHING

adaptation.—Since the eyes ıut 30 minutes of dark adap- ıre becoming efficient at low umination, any duties which e almost immediate use of ould not be undertaken until l has elapsed. Fortunately, in complete darkness is not since it has been discovered ds are relatively insensitive ht. Results which are ob- wearing red goggles for 30 remaining in a room lighted d light, are very satisfactory. ir-sea rescue work, a period ll usually precede any search- sea, and in most cases this provide a time quite adequate daptation, providing the in- he aircraft is lighted very ferably with red light. If ıent panel lights and the in- ing are kept too bright while flight to the area, your night be reduced greatly, and you ok objects on the sea which within the visual range of ght-adapted eyes.

enance of dark adaptation.— ıutes of exposure to bright, will largely, if not entirely, e results of many hours of ation. Therefore, men who ne dark-adapted must not vision by exposure to bright, . If maps and charts have or if other objects must be under light, use red light ble (a red flashlight can eas- by taking a red plastic lens readaptation goggle and in- inside the glass lens of the If white light must be used, dim as possible, use it for time as possible, illuminate st possible area, and do not t rays to enter the eye.

ing.—In order to make sure rt of the surface of the sea ed, and that every object al range is seen, certain basic t how to scan must be ob- rst of all, the scanning pat- over the area as frequently without becoming so coarse ase the possibility of over- object. Any simple geo- ıttern is sufficient so long as e best use of off-center vision. e simplest method is to scan as if reading a book, moving the eyes *and head* in jumps of about 12° to 20°, allowing the eyes to pause for about 2 seconds at the end of each jump. Following a complete scanning sequence after the complete covering of the assigned sector, the eyes should be closed for about 10 seconds to allow them to rest.

4. *Visibility through plastic surfaces.*—All plastic surfaces absorb some of the light which passes through them. Consequently, when working at very low levels of illumination, it is necessary to make the best use of the small amount of available light which does pass through. First of all, it is extremely important that surfaces be kept very clean. In a plastic which permits the transmission of 90 percent of the available light, perhaps 50 percent of this light may be lost by having a slight film of oil or dirt on the surface. Similarly, scratched windscreens should be replaced immediately, due to the fact that they cut down on the amount of light and distort the visual image which reaches the eye.

Instrument panel lights and interior lighting fixtures may be kept very dim and still interfere with visibility outside the aircraft by producing annoying reflections in the plastic panels. If an attempt is made to look through a windshield which is illuminated by reflected light, the probability of seeing anything is very remote.

5. *Binoculars.*—The standard Navy 7X50 night-treated binocular is an excellent aid to night observation under all conditions except those of extremely low visibility brought on by fog or rain. When binoculars are used in scanning at night, the same principles of off-center vision apply. The binoculars should be held straight forward and the eyes turned off-center towards the periphery of the field. It will require practice to learn to do this effectively, but the final results obtained will more than justify the effort.

6. *Concentration.*—Scanning the sea at night for long periods of time is at best a dull job. It is extremely easy to make the fatal error of daydreaming while gazing into space. Many instances are on record where enemy ships were able to get well within visual range before being sighted, even though lookouts were "looking" in that direction all the time. Every effort must be made to keep the mind as well as the eyes on the job at all times if the all-important job is to be done properly.

SPECIAL PROBLEM OF THE SURVIVOR

Scanning.—In view of the multitude and complexity of the problems facing the survivor at sea in a life raft or open boat, it is fortunate that his visual task is relatively simple. He becomes dark adapted shortly after nightfall, with no effort, and the maintenance of his dark adaptation is the least of his worries. His only night vision problem is one of setting up an efficient searching scheme so that no possible rescuer will go unnoticed, and so that he will be able to signal any plane which he may be able to spot.

This is again a matter of an efficient scanning pattern. The same techniques apply here as those outlined above, except that it is a job of scanning the entire night sky. Particular attention should be paid to scanning the relatively lighter areas of the sky, such as light clouds, areas with many bright stars, and the general vicinity of the moon, because it is in these places that the contrast between an airplane and the background will be the greatest, and here that the most efficient use of the principles of night vision can be applied.

Navy Tablet Ration Developed by NMRI

The U. S. Navy emergency ration for life rafts developed by the Naval Medical Research Institute is now being included in the Navy Bureau of Aeronautics emergency kits. This ration will replace the former Bureau of Aeronautics life raft emergency ration, which consisted of chocolate, malted milk, and "pemmican." The new ration was designed to be easily edible and physiologically compatible when the water supply is limited, to provide a variety of items, and to be compact and easily stowable in parachute back-pack kits.

As should be the case with all items of emergency equipment, the development of a suitable ration for survivors requires considerable research and experimentation. The basic factors, plus those mentioned above, determining the adoption of a ration are:

It should be concentrated, thus furnishing a large number of calories in the allotted space.

It should not cause nausea and vomiting.

It should consist of a food which can be swallowed with a minimum of difficulty when the mouth is dry.

It should not accentuate thirst.

It should produce a maximum volume of water of oxidation when assimilated.

It should entail loss of a minimum volume of urine in the excretion of metabolic end-products.

It should be so "divided" as to lend itself to easy distribution to survivors on the raft.

It should not deteriorate or change character after long stowage periods.

It should not be affected by great temperature extremes.

It should be packed in a container that will withstand the effects of salt water immersion.

Packed in a 3⅞ by 2⅛ by 1⅛ inch key-opening tin container are the following components:

Number	Item	Weight	Calories
		Grams	
5	Sucrose-citric acid tablets (fruit flavors)	20	80
10	Sucrose-lipid-citric acid tablets	38	195
8	Sucrose-malted milk tablets	27	110
2	Multivitamin tablets.		
2	Sugar-coated gum tablets.		
1	Waterproof cellophane bag,		
2	Clips for closing bag.		

The characteristics of the constituents of the ration are:

Sucrose-citric acid tablets are the commercial fruit-flavored Charm candy. Citric acid, which is added to all the tablets except the malted milk, tends to increase the flow of saliva in the mouth.

Sucrose-lipid-citric acid tablets closely resemble commercial butterscotch, but contain slightly over 20 percent fat rather than the 10 percent fat content of commercial butterscotch. Fat is the most concentrated source of calories and when oxidized in the body produces more water than other food constituents. In a report of tests conducted by Dr. Allen M. Butler, of the Office of Scientific Research and Development, it was indicated that the addition of fat (lipid) to sugar (sucrose) renders the ration less nauseating.

Sucrose-malted milk tablets, without the citric acid to provide variety of taste, were included in this new ration because of their reasonable acceptability with survivors. The addition of sugar tends to reduce the bitter flavor of the malted milk.

Chewing gum gives the mouth a "clean" taste and stimulates salivary flow.

Multivitamin tablets, although not essential, are provided so that in the event of an injury or perhaps a prolonged survival period they may make up for vitamin deficiency.

The sucrose-citric acid and the malted milk tablets each measure about ¾ by ¾ by 5/16 inches. The sucrose-lipid-citric acid tablets are provided for in the form of two segmented bars of five tablets, each measuring about 3½ by ¾ by ⅜ inches. All tablets are wrapped individually in cellophane and a waterproof cellophane bag is provided to give additional protection to uneaten tablets in the survivor's pocket.

At present three of these cans are supplied per man in Bureau of Aeronautics parachute seat type and multiplace rafts. A survivor consuming one-half a can a day will derive about 190 calories daily for 6 days.

New Life Preserver

(*Continued from page 14*)

standard type Navy kapok life jacket, the Navy knapsack type kapok life preserver, the standard type Merchant Marine kapok life preserver, the undersuit type Merchant Marine kapok life preserver, the Army invasion type kapok life preserver, and the kapok life preserver developed by the Army at the New York Port of Embarkation.

During the course of its study the subcommittee noted the observation that certain deficiencies exist in the fire-resistive treatments of the cotton drill covering material now available, and suggested that there is need for investigation and development in the field of suitable fire-resistive treatment for life preserver coverings. It was noted particularly that present treatments are "tacky" and rub off easily on the clothing, and that they are sticky and prevent proper pulling of the drawstring to make a tight fit.

Still Improvised by Surv Lifeboat

How a resourceful survi structed a fuel still from no lifeboat and life raft gear and to provide drinking water fo and 37 companions adrift 1(illustrated in the accompanyir

Their ship had been attac Japanese submarine. One missed its mark but two fo target. Three seamen were k the ship was abandoned. On was destroyed by an explosio others became targets for the s when it surfaced. The Japs the portable radio, damage tanks in the remaining lifeboat rafts, and made prisoners freighter captain and three m his crew.

The 38 remaining membe crew climbed aboard one avai and later picked up a capsi Injured and wounded were tr the remaining small water su rationed to 7 ounces per day Later a second raft was sig taken in tow providing a li water and food.

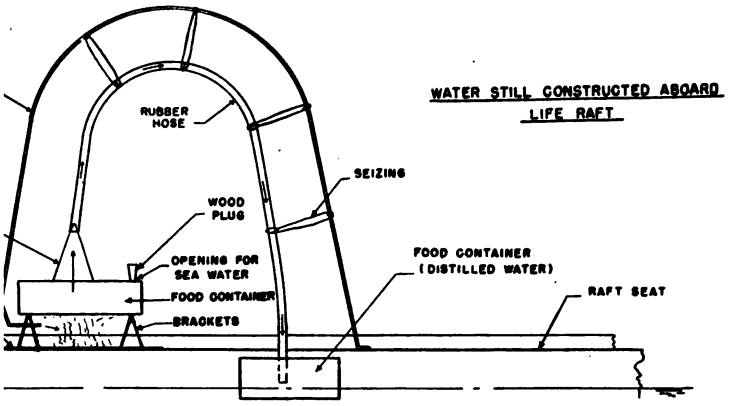
On the third day survivor Jol Drechsler, a junior assistant decided he could make drinki and proceeded to build a still vaged lifeboat and raft pieces Drechsler's still involved the principles of steam distillat made his evaporator from a food container. Other parts a cone-shaped storm oil can, a rubber hose, odd lengths of pi food tank which was used a densor.

The effectiveness of the proved by its production of 60 potable water in less than 48 operation. After the still wa operation, it was possible to inc water ration to 12 ounces each on board.

On the morning of the sixt after the torpedoing a friend was sighted and rescue was lished. The survivors were p 2 days later.

An excerpt from a letter by Consul Stephen E. C. Kendri Secretary of State, reported, i follows:

"The legal representative a for the United States War Shi



has transmitted to his committee the view that er is deserving of special on. The consul heartily en- opinion and recommends ration be given to award- Drechsler the special medal en designed to give due rec- eritorious acts of American amen. Not only did Mr. vise and build the means save the lives of his companions and his own but his conduct throughout the entire trying ordeal was, in view of his shipmates, deserving of the highest praise."

Drechsler has been notified of the Distinguished Service Medal award. The crew agreed that, if it had not been for the drinking water from the improvised still, many of the 38 crew members would not have survived 16 days adrift under a blistering sun.

AIRBORNE LIFEBOAT

(*Continued from page 11*)

ors drift to the boat, re- its container, and by pull- se cable on the CO_2 cylin- ically inflate the main air he containers are hauled outboard motor installed, ged. Enough fuel is pro- e the boat about 50 miles. ncreased by the use of sails. the boat to be very maneu- will sail into the wind. It nen or more, is about 15 feet eet wide, has 2 cross-seats hand pump, 2 vertical bulk- top rail or "splash tube" ated by a CO_2 bottle. The of the boat carry repair sailing instructions, hand and oars, hammock-beds, ning equipment, and sea an- hipwreck kits are dropped ir, and the contents have to meet the special need of s. The newly proposed kit

Item
Compass.
Emergency signaling mirrors.
Drinking water.
Permutit kits.

Quantity:	*Item*
1	Sponge.
4	Drinking cups, graduated.
2	Fishing kits.
1	Knife, scout type.
2 cans	Tomato juice, 12-ounce.
2 cans	Chicken broth, 12-ounce.
1	Plastic whistle.
3 cans	Sunburn ointment, 3-ounce.
50 feet	Cotton line, 75-pound.
1	Assortment safety pins; adhesive tape.
12	Life raft tablet rations.
1	Waterproof flashlight, 2-cell.
1	Spare bulb.
1 set	Extra batteries.
1	First-aid kit.
2	Pyrotechnic projector kits.
12 cans	Sea marker dye.
1	Woolen blanket.
1	Poncho.
1	5-quart plastic water bag.
210 feet	Floating rope.

The complete gear weighs approximately 700 pounds; separately approximate weights are: boat 350 pounds; motor 200 pounds; fuel 50 pounds; shipwreck kits, 60 pounds each.

There are 500 of these airborne rescue boats on order. Delivery was scheduled to begin 1 September 1944.

The Navy is working also on the development of a rigid airborne lifeboat.

BOMBER COMMAND DEVELOPS KIT FOR OVERWATER FLIGHTS

Many units in the field have had to develop their own emergency gear because of special missions or the inadaptability of available supplies. The improvisations of many have been well worth commendation, not only for meeting the needs of a serious situation, but for using their ingenuity in making proper use of the materials on hand.

For example, the Thirteenth Bomber Command at Kuli Field in Guadalcanal has developed an individual kit that will supplement life raft equipment or provide sustenance for survivors forced to bail out over water. The "Parachute Kit," as dubbed by its inventors, is demonstrated in the AAF Weekly Film Digest No. 46.

The contents of the kit include:

Quantity:	*Item*
4 cans	Emergency drinking water.
1 can	Sea dye marker.
3 units	D rations.
1	Emergency signaling mirror.
2	Carbon dioxide cylinders.
1	Very pistol, M–9.
2	Signal flares, M–11.
1	Compass.
2	First-aid kits, aeronautics.

All the items are tied together with a fishing line, and each item, with the exception of the pyrotechnic pistol, will float. The canvas container with a waterproof zipper is approximately 12 inches long, 7 inches wide, and 5½ inches high. Water resistant tape seals the zipper as an added precaution.

The kit is carried near crew stations aboard the aircraft so that when an overwater emergency arises, the kit will be easily accessible. The airman straps the kit to the right side of his parachute harness for which hooks and eyelets are provided. The kit fits behind the elbow and does not interfere with arm movements when the ripcord is pulled.

The gear is specially designed for bomber groups who decide to bail out rather than ditch their aircraft. It is estimated that the contents of the kit will provide sustenance and rescue aids for a period of 10 days. The compactness of the kit makes it useful for fighter pilots as well as bomber crews.

LAND AND SEA SURVIVAL PHA

One Part of Navy's Survival Training Program for Aviators

[EDITOR'S NOTE.—Articles dealing with the various phases of the survival training program planned for Navy aviators will be published in Air Sea Rescue Bulletin.

The land and sea survival phase is discussed below. "Water survival" will appear in the next issue.]

The Navy has defined survival training as: *"Preparation of individuals or aircrew units for emergency situations occurring in operations which will afford them a better chance of safely returning to fight again.* It covers the knowledge and skills needed from the time an emergency arises until rescue is achieved, or the survivors reach their home base." To meet this objective instruction was first incorporated in the training program for Naval aviators.

The training syllabus is designed progressively; the elementary and basic instruction being given during the preflight stage, and more detailed and specialized information taught through primary, intermediate, and operation phases of training. The Navy has anticipated a training program that will cover instruction for the period of time an airman prepares to leave his plane, on the water or land, until he is picked up by rescue units and returned to base. The fundamentals of survival which fliers are taught include the operation of emergency rescue equipment, procedures of ditching aircraft and bailing out, techniques of water survival, adapted skills of hand-to-hand combat and gymnastics, methods of communicating with rescue units, precautionary measures and medical treatment for typical ailments, and principles of land and sea survival. At present, the complete plan is not in full operation, but as soon as this program is established, the centralized administration of a program of instruction for enlisted personnel of aircrews will be developed.

PREFLIGHT TRAINING

One phase of the Navy survival training program was started over a year ago at Chapel Hill Preflight School—The Land and Sea Survival instruction. Provided that rescue facilities were ideal, instruction for living at sea and off the land would be unnecessary. However, survivors of an aircraft disaster must know what to do until rescue arrives, when rescue is delayed, or if rescue fails. This course has been designed to teach pilots the basic principles of living off the land and sea which may be applied to any part of the world. Emphasis is placed upon *individual* survival and consists of information and instruction of techniques and skills which enable men to survive with a minimum of emergency gear until rescued.

The fundamentals taught at Pre-Flight Schools include:

a. Travel in all types of terrain.
b. Orientation to their situation.
c. Collection and identification of plant and animal food.
d. Location of water and water substitutes.
e. Construction of shelters.
f. Preparation of food, including firemaking and cooking.
g. Knowledge of the biological and physical hazards in the area in which the training is given, and the relationship of these hazards with similar ones in other parts of the world.

Instruction is divided into classroom lectures to acquaint the cadets with the principles outlined above, and field trips planned to put into actual practice the techniques and information learned in lectures. The classroom work consists of 12 lectures supplemented by colored lantern slides. The basic text for the course is the Naval Aviation physical training manual, *How to Survive on Land and Sea.* Survival movies, such as *Castaway, Land and Live in the Jungle, Land and Live in the Desert,* and *Land and Live in the Arctic,* are screened in the evenings. A demonstration room with the latest emergency equipment for individual fliers is set up at each preflight school for interested students. Also included in this display may be an exhibition of improvised equipment pertaining to special areas, such as articles made from the tropical coconut and bamboo, or an exhibit of fishhooks, fishing line, and m ous items. A permanent demo camp is constructed near the enable instructors to teach t quickly. This area usually types of bough beds, snares, fires, and ovens.

The cadets are taken on t half day field trips on which taught special techniques suc pelling, construction of raft search for plant and animal similar problems. After re foundation of survival techni procedures, the class goes on day trip which is especially p simulate emergency situations as possible. A battalion of ca sisting of 200 to 300 men, is supervision of four or five su ficers, plus as many platoon talion officers as can be spared in maintaining discipline. The in excellent physical condition up under the rigid and rug through the wilderness. The 40- to 45-pound pack made u the essential items for livin land, such as sleeping bag, cant pass, mess gear, headnet, signa ror, and machete. A supply of is taken, but the men are la pendent upon the available animal food for their subsist

SELECTING DEMON TION AREA

The survival program emph value of actual activity and e of each individual cadet, and the selection of a demonstra that would incorporate as ma fundamentals of land surviva important. It must be situa large area with many natural for food and shelter, have st water supply, fishing and n and include a variety of terrai onstrate methods of orienta travel. The field work at Ch resembles jungle training as possible in the temperate regi area selected is very densely similar to a tropical forest i to travel, orientation, and so f men make a continuous trip forests, along ridges and val swamps, and across large riv

TRAINING AT ST. MARY'S COLLEGE

The field area at the preflight school at St. Mary's College, California, consists largely of vast, untouched mountainous country, with a large lake, mountain streams, and heavily wooded redwood canyons. The men make a 35- to 40-mile trip. To illustrate the application of the principles taught, a synopsis of the trip is related. The first lap of the journey is through redwood canyon country where men make camp for overnight. The following morning the battalion is divided into groups and instruction is rotated. One group goes to the lake for instruction on fishing, signaling with mirror, and crossing the lake in rubber rafts. The other group of four platoons hikes through the canyon, learning from the instructors the edible plants of the region with emphasis placed on the similarity of these plants to ones found in other parts of the world. They proceed on farther down the stream. Here they fish, using the various methods discussed, and employing improvised hooks and lines.

During the afternoon the entire party crosses the lake and hikes to a second camp area. In the evening they set snares for game, do some night fishing, set night lines, and swim for recreation. The following morning they again break up into three groups. Group I receives instruction and experience in lake and stream fishing and swimming; group II has a snaring demonstration, and the third group has map and compass work. Throughout the morning and part of the afternoon this instruction is rotated. Then they break camp and hike to the third campsite. The fourth morning, after lifting snares, eating, and breaking camp, the group hikes to the top of the ridge for rope work. At four that evening the entire battalion returns to the base. Unlike training at other preflight schools, the program at St. Mary's does not include night hikes because of the dense growth of poison oak throughout this mountainous country. At each campsite every cadet makes his own bed, shelter, and fire, and prepares his own meal.

STATE PARK CAMPSITE AT IOWA

The area in the immediate vicinity of the preflight school at Iowa consists of open corn fields unsuitable for land survival instruction. The battalion hikes 16 miles along the Iowa River to a State Park, which provides ideal surroundings. Large wooded areas furnish natural foods and materials for shelters and fires, the lake and streams serve for training in river crossing, swimming, and fishing, and the mud flats at one end of the lake give the cadets experience in crossing simulated swamp and bog areas. At this station the men make a permanent camp and take daily field trips and night hikes through the park area.

The terrain at Georgia Preflight School, with its woods, rivers, and swamps, is similar to that at Chapel Hill, except that it is a little more open. It is interesting to note that, although the schools are located in the temperate regions of the world, the over-all survival program is little affected by the change of seasons. During the winter emphasis is placed upon warmth, shelter, and securing game. During the spring and summer the training tends to be more or less jungle in characteristics. The availability and identification of plants is the part of the training most affected by seasons. The men are kept out and continue their work regardless of the weather. Several hospital corpsmen travel with the group to give first-aid treatment. However, the cadets are in very

good physical condition, and only 5 or 6 of the 300 return to camp before the trip is completed. The first class of naval aviation cadets began their survival training course over a year ago at the U. S. Navy Preflight School at Chapel Hill, N. C. From the first class of 300 students, the program of instruction has been expanded to meet the needs of thousands of men at the four schools described above.

INTERMEDIATE TRAINING

Plans for the extension of land and sea survival training have been proposed for inclusion in the intermediate stage of the aviators' course. The purpose of this advanced course is to give the pilots more specific information and specialized instruction about particular areas. The program of instruction emphasizes the most important information learned in preflight and does not duplicate the instruction previously learned. This advanced course, now partially underway at Pensacola, includes four lectures on the topographical areas of the world:

1. Survival at sea.
2. Survival along the seashore.
3. Survival in the arctic.
4. Survival in the tropics, with special emphasis on plant life.

The group is then taken on a 2-hour tour through a survival exhibit designed to illustrate visually survival procedures, emergency equipment, and technical information. The following exhibit rooms for this purpose have been constructed at the Naval Air Station at Pensacola, Fla.

A *lobby* contains survival literature and training pictures. Wall maps show battle theaters, native peoples, and vegetative regions, such as deserts, jungles, etc., of the world. Lecture in this room includes a discussion of the best procedure for dealing with natives in the various parts of the world, and the relationship of survival techniques in similar topographical areas around the globe.

The *Flight Room* is constructed around the actual hull of a PBY. One half of the aircraft with the "skin" removed is inside the flight room where students can actually view the internal structure of the craft, the stowage of emergency equipment, escape hatches, and ditching positions. The other half of the hull, with the "skin," extends outside the building. The PBY is completely manned and equipped. Oxygen equipment and an anoxia display are also part of this exhibit.

The *Chute Room* is especially designed with an aerial view of the ground marked to indicate the proper and improper place to land when bailing out. Mannequins are used to exhibit parachutes with the regular Navy chute harness, and back, seat, and chest packs. The room contains diagrams of free fall and chute fall.

The *Float Room* is to demonstrate survival at sea. A one-man raft and four-man raft with mannequins and complete raft equipment are to be adrift in the tank. On the wall are displays of emergency equipment, food and water available at sea, improvised fishing gear, simple navigation instruments, and illustrations of ocean birds. Plans have been designed for one large saltwater aquarium which will contain poisonous and dangerous fish, and another for common edible fish. Instruction here covers birds and lagoon glare as indicators of land, and means of obtaining food and water at sea and along the seashore.

The *Arctic Room*, depicting a scene above the timber line and in timber, is designed to illustrate the principles of

ubzero weather. Emphasis is placed upon im-
f equipment, such as snow cave, bough lean-to
ke-shift foot gear, and bird and rabbit snares.
includes personal health, arctic food plants, fire
preparation of emergency food.

ic Room are found shelters, snares, cooking uten-
gear, and other emergency equipment made
l materials. This room also includes a green-
ropical food plants, such as coconut, pandanus,
gweed, papaya, plantain, yams, and other emer-
lants to train the students to identify plants in
habitat. In addition, a survival scene with a
, parachute hammock, fire, etc., has been con-
tidal pool contains common crustacean and shell
ong the seashore.

outside the building is the *Field Exhibit*. This
semipermanent camp that might be constructed
s. In addition to the shelters, displays include
trines, drip food coolers, fox holes, smoke house,
nd snares. The area, which is the conclusion
e tour through the Survival Training Exhibit,
o illustrate the foregoing lectures and demon-
ndamentals of survival at sea, in the arctic and
pecial work area will be set up so that the cadets
the equipment and fashion such items as fish
ng sticks, bark shoes, and fish nets.

hase of the land and sea survival program in
aviation training is a 1½-day field trip espe-
d to give the cadets and pilots experience in
a and along the seashore. Men travel in groups
nd carry a minimum of equipment in order to
al conditions and develop the skills necessary
n their own initiative in an emergency. A de-
of the field trip conducted at Pensacola illus-
mpleteness of training planned for aviators.

wet basin in barge with the following equipment:
Vest," one-man rubber raft, one canteen of water,
e, fishing kit, one box emergency aircraft rations,
s in waterproof container, dark glasses, hat,
mosquito dope and headnet, flashlight, knife,
ng mirror. Go fully clothed.

1 mile off Santa Rosa Island opposite Biological
. Inflate "Mae West," jump overboard and
pararaft; paddle to given landmark on shore.
campsite. Dry out equipment. Instructions
ctice in: Securing bait; fishing from shore and
crabbing; setting lines for sharks; fish traps;
snares; preparing fish and crabs; cooking and
g; meal of prepared food and rations; flounder-
crabbing at night (using makeshift spears and
). Sleeping on sand or rubber raft—preparation
Use of mosquito dope and headnet.

y (reveille). Digging for fresh water. Fish-
reakfast. Seashore food and water plants—
ion and use. Observation of stingrays and
Preparation of a trench shelter.

down bay side of island to given location. Fish
e. Signal other rafts with mirrors. Rig up
raft.

meal of wild plant and animal foods obtained
morning. Observation of animal tracks and

p by barge and return to base.

Additional Types of Equipment

(*Continued from page 15*)

Catalog number	Object	Source
44.235.1.1-4	Raft book, chart, and tape for emergency navigation by Harold Gatty.	OQMG, Washington, D. C.
44.236.1-2	Rationers, plastic for water, 10-ounce (2).	BuAer, Washington, D. C.
44.237.1	Shark chaser, life jacket (in experimental package) Spec. No. R51S48 (INT) BuShips.	Do.
44.239.2.1-2	Suit, exposure, and bag (yellow), British.	Squadron Leader E. A. Pask, R. A. F. Delegation, Washington, D. C.
44.239.3	Pillow, inflatable, with duckbill automatic closing flapper valve.	Do.
44.239.4.1-3	Suit, exposure (experimental) and gloves.	Do.
44.240.1.1-8	A. E. F. Waterlight (automatic electric floating light).	A. E. F. Waterlight Corporation, 453 West 47th Street, New York City.
44.241.1-2	Morner life jacket	Watertight Slide Fastener Corporation, New York City via Count Morner.
44.244.1.1-37	Fishing kit, one man NAVAER-M-627.	BuAer, Washington, D. C.
44.245.1-3	Light, electric, for life preserver (3).	SO. Norfolk Navy Yard, Portsmouth, Va.
44.246.1-2.1-54	Shipwreck kit, Aircraft, NAVAER M-594A.	Naval Aviation, Supply Depot, Philadelphia, Pa.
44.247.1	Flashlight USN type A 2066	BuAer, Washington, D. C.
44.248.1	Stretcher, hospital, semi-rigid	U. S. Naval Medical Supply Depot, Brooklyn, N. Y.
44.249.1	Hammock, jungle	Manufacturer.
44.251.1-13	Transmitter set SCR-578-B "Gibson Girl."	Coast Guard Radio Repair Shop, Berkley, Norfolk, Va.
44.252.1.1	Preserver, life, pneumatic, oral-inflated, German.	Technical Staff, Office of Chief of Transportation.
44.252.2.1	Vest, life, oral-inflated, German.	Do.
44.254.1	Litter, metal poles	Bureau of Medicine and Surgery, Washington, D. C.
44.255.1	Very's pistol Mk. 3	N. A. D., Saint Juliens Creek, Portsmouth, Va.
44.255.2	Pyrotechnic pistol AN-M8	Do.
44.259.1.1-2	Mirror, reflex button and case, M-580-A.	Signal Service Corporation Irvington, N. J.
44.263.1-2.1-17	Raft, pneumatic, one-man parachute type AN-R-2B (2).	USN, Pawtucket, R. I.
44.264.1	Pistol, Very's, Mk.2	NAD (25), Fort Mifflin, Philadelphia, Pa.

The field of survival training is comparatively new. There has been a lack of trained instructors and training literature. From July to September the Navy conducted two 4-weeks survival courses especially designed for instructors. The purpose of the instructors' school was to broaden the background of officers who had been teaching some phase of survival and to train additional officers to meet the needs of the expanding program. The scope of the course included the complete training program given pilots plus additional reading assignments and field work.

BOOK REVIEWS

SURVIVAL, by Army Air Forces

The Army Air Forces Survival Manual, prepared by the Arctic, Desert, and Tropic Information Center, is a concise pocket edition of survival information applicable to the various climatic and topographical zones. This small manual is stowed in life raft equipment and all emergency vests and back pads so that it will be available at the scene of the disaster. The emergency aids and instructions aim to help the survivor avoid hardships and maintain health, to find the two essentials—food and water, and ultimately to come back alive.

The first section of the booklet deals with the emergencies to be met on land. General topics such as the immediate action to be taken after crash landing or ditching, first aid, shelter, clothing and others are discussed by telling the pilot how to meet these problems in the order in which they will most likely appear. It instructs him by first giving the general methods and principles of doing them, followed by special instructions for particular areas—jungle, desert, arctic.

In the same concise and comprehensive manner, the second section discusses the considerably different problems to be met at sea.

SURVIVAL, Air Forces Manual No. 21W, may be obtained upon request to Training Aids Division, Office of the Assistant Chief of Air Staff, Training, Headquarters Army Air Forces, 1 Park Avenue, New York City 16; or Publications Section, Matériel Command, Army Air Forces, Patterson Field, Dayton, Ohio.

SURVIVAL ON LAND AND SEA, by Navy

The Bureau of Aeronautics has included special information for aviation personnel in the revised edition of the O. N. I. Survival Manual prepared by the Ethnigeographic Board and the Staff of the Smithsonian Institution. The pamphlet points out that the five prerequisities of survival are drill, equipment, knowledge or survival techniques, geographic features, and natives, common sense or adaptability to the sit-

PUBLICATIONS RECEIVED

Air Sea Rescue Agency Technical Library

June 7–October 10, 1944

ABSTRACTS

Design of an Individual First Aid Kit for Aviation Personnel.
Report on project gives development of a compact two-unit plastic containe to afford moisture resistance, and shock and abrasion protection for essenti equipment for personal use by pararaft borne individuals. Each item (tablet etc.) retains its moisture resistant protection after seal is broken. Contents to essential items for use by individual aircrew persons. Approximate dim container are 4 by 3 by 1.5 inches and approximate weight filled but excluding t case and triangular bandage is 4.7 ounces. Appendices include directions for use fications with drawings.
Source: Design of an Individual First Aid Kit for Aviation Personnel. Nav Research Institute, Bethesda, Md. 31 May 1944. (Research Project X–371)

Causes and Control of Deterioration of Matériel in the Wet Tropics. (RESTRICTI
Report covers the effects of moisture, fungi, insects, mites, and marine bo classes of matériel, with particular reference to Air Forces equipment. The fi discusses the problem from the layman's point of view, with as few techni possible. Topics covered are: Causes of deterioration, materials subject to d types of damage, and control. The second section is an appendix carrying d technical information.
Source: Causes and Control of Deterioration of Matériel in the Wet Tropi Desert and Tropic Information Center, The AAF Tactical Center. 18 July 1944 Project No. T. 25.)

Flying Safety; Air-Sea-Land Rescue. (RESTRICTED.)
Manual covering procedure and facilities as developed in Third Air Force. control sectors, functions, and procedure of air sea rescue control, aircraft for rescue, communications, radar, crash boats, and coordination. Charts includ crash is reported, Overwater ranges and flying areas—Rescue boat installations, installations, Air sea rescue areas, HF D/F installations, Flight control comr (CAA), and Search and rescue operations.
Source: Flying Safety; Air-Sea-Land Rescue. Third Air Force Manual 62– Fla., Headquarters Third Air Force, 15 July 1944.

Pacific Ocean Handbook.
A manual of essential science and underlying knowledge pertaining to the P Body of work is a geographic discussion divided into American and Asiatic sec pendices present quick information on area and population, sea and air dista velocity and visibility scales, land and sea life, foreign weights, measures an and a chronology. Global maps are inserted. The author is Professor of geo international trade, Stanford University.
Source: Pacific Ocean Handbook, by Eliot G. Mears. Stanford University, Ca Ladd Delkin (c1944).

BIBLIOGRAPHIES

Arctic, Desert and Tropic Information Center.
Survival, a selected bibliography. ADTIC Project no. G–21. 1 July 1944. (

DICTIONARIES

Baughman, Harold E.
Baughman's Aviation Dictionary and Reference Guide. Aero-Thesaurus. printing. Los Angeles, Calif., Aero Publishers (c1942).
Japan. Imperial Aeronautical Association.
Aeronautical Terms. On cover: Headquarters Army Air Forces Dictionar nautical Terms: English, French, Japanese, German. Reproduced under sup Director of Intelligence Service, Washington, D. C., 1942.
U. S. War Department.
Dictionary of United States Army Terms . . . 18 January 1944. (*Its* Manual TM 20–205.) (Restricted.)
Velazquez, Mariano.
A New Pronouncing Dictionary of the Spanish and English Languages: C Mariano Velazquez de la Cadena and Edward Gray (and) Juan L. Iribas, w ment of New Words by Carlos Toral. Chicago, Wilcox and Follett Co., 194

AIR-SEA-LAND RESCUE SERVICE

Air-Sea Rescue Service. Northern California Sector. Western Sea Frontier.
Emergency Action Analysis. Reports. South San Francisco, Calif., Coast Station, 1944. (Restricted.)
Monthly Statistical Summary of Emergency Action and/or Crashes. Peri April 1944 to date. South San Francisco, Calif., Coast Guard Air Sta (Restricted.)
Air-Sea Rescue Task Unit. Southern Sector. Western Sea Frontier.
Air-Sea Rescue Operations Manual. Tentative Draft. (Coast Guard Air S Diego, Calif., 1944.) Mimeographed.
Great Britain Air Ministry.
Manual of Air-Sea Rescue. Mimeographed. (Restricted.)
R. A. F. Mountaineers.
From: This Week, March 5, 1944, p. 6–7.
Spilman, Lawrence A.
Spansh Life-Saving Service. Madrid, Spain, 1944. Letter dated: 25 July
U. S. Army Air Forces. School of Applied Tactics. Aero Medical Dept.
Personal Equipment Officer's Manual. (Orlando, Fla., 1944. Mimeograph 1 June 1944. (Restricted.)
U. S. Army Air Forces. School of Applied Tactics. Air-Sea Rescue Unit.
Air-Sea Rescue (by) Air-Sea Rescue Unit, Strategic Bombardment Divisi Operations Department, AAF School of Applied Tactics, AAF Tactical Center Fla. (1944.) (Restricted.)

TRAINING AIDS AND PUBLICATIONS

CLOTHING

V.
Suits. Typewritten.
Research Institute.
-Resistant Properties of Fabrics Proposed for Flight Clothing. (Its Research 72.) Mimeographed.

EMERGENCY EQUIPMENT

er H.
ld Tests of Gallowhur and Higgins Solar Stills. (1944). Typewritten.
)
Research Institute.
n of Methods for Cleaning and Sterilizing Oxygen Masks. (Restricted.)
s on Polaroid X-29 Aviation Type Goggles. (Its Research project X-203B.)
ed.
Ventilated Dark Adaptation Goggles and Ventilated Polaroid Aviation Goggles Fogging. (Its Research Project X–210B.) Mimeographed.
troversy. From: Life, June 12, 1944, p. 112–114.
r Forces. Matériel Command. Engineering Division.
mmersion Heater for Thermos Jug. Photostated.
ıard. Merchant Marine Inspection.
ion for Life Preservers, Kapok, Adult (Jacket Type) Style MM–10. Washing-944. Processed. Dated: 5 June 1944.
ard Air Station, San Francisco, Calif.
f Tests, Naver Modified M59½ Droppable Shipwreck Kit. (Typewritten and material.)
r Training Center.
l Evaluation: Comparative Testing of Experimental Oxygen Masks. 12 April earch project X344 (Av–188–f), X–277 (Av–147–a), X–143 (Av–R2–6), Pre-ort: Appendix A.)
ıtion of Comparative Oxygen Economies of Oxygen Equipment. 20 March earch report X–174 (Av–R2–7), Report No. 3.) (Restricted.)
ous Emergency Rescue Gear, Test of. TED no. UNL–2586.
ical Testing of Baldwin Rubber Company Mask. (Research Report X–314 Report No. 1 (final).)

FISH, POISONOUS

and Harmful Fishes.

HEALTH AND MEDICAL INFORMATION

and Tropic Information Center.
ıd Disease in Borneo, Celebes, the Moluccas and Lesser Sunda Islands. (Re-ıal Studies, No. 10.)
ıd Disease in Polynesia (South Pacific Islands). (Regional Medical Studies

Tropical Diseases for Air Forces Medical Officers: Part I. Malaria, II. Dengue, ıal Disease, V. Tropical Ulcers and Desert Sores, VI. Filarial Diseases, VII. Typhus, VIII. Intestinal and Other Parasites, IX. Cholera, X. Plague, XI. ever.
by Snakes, Plants, and Fish. (Informational Bulletin, Medical Series, No. 4.)

tory Strains of Heat, Work, and Dehydration, by A. H. Brown and E. J. Towbin. ıratory Unit of the University of Rochester. Processed.
donald.
—*Survivors;* a medical study, by Macdonald Critchley, with 11 illustrations. A. Churchill, Ltd., 1943.

ion of the Drowned Today. From: Journal of the American Medical Asso-il 1, 1944, pp. 964–967.
ppographical Department.
t of Heat and Humidity on Troops. I. S. T. D./F/457. London, 1944. (Restricted.)
Research Institute, Bethesda, Md.
Preventives for Use on the Lips. Bethesda, Md., 1944. Processed. Dated: 44. (Restricted.)
r, and E. F. Adolph.
Dehydration.
nges Occurring in Feet Exposed to Cold Water and Evaluation of Insulation of Protection. (Naval Medical Research Institute. Research Project X–297, .)
Forces. 111 Fighter Command.
After Emergency Landing. Pilots Medical Handbook. (Drew Field, Fla.,
ard.
for Restoring the Apparently Drowned: for saving drowning persons by their relief, and for the treatment of frostbites.
Training Center.
of Hyoscine on Motion Sickness in Aircraft. (Research Report X–252 Report No. 1.)
artment Bureau of Medicine and Surgery.
for Battle Casualties: You May Save His Life. (Washington, D. C., U. S. Printing Office.) 1943.

LIFE RAFTS AND LIFEBOATS

oat, Army Designation Type A–1, Specification 40743. Typewritten.
e Collection Agency, CBI.
fe Raft. (From type 97. 2EB. Sally, Mk. II.) Photostated. (Restricted.)
r-Craft. From "Pic," July 4, 1944, p. 12–14.
Forces. Matériel Command. Engineering Division.
feboat. 28 April 1944.
feboat. 29 April 1944.

BOOK REVIEWS

uation, and the will to live. It is designed primarily for instructing pilots of single-seated landplanes the correct procedures for bailing out, ditching, crash landing, and water safety. The prescribed methods of preventing body dehydration by rigging sunshades, dunking clothing, and performing a minimum of duties are discussed. The supplement stresses the importance of rationing the water supply, preventing loss of water stored in the body tissues, means of increasing the water supply with desalination equipment, if available, and collection of rainwater, and the relationship of fish, emergency rations, and water requirements when adrift.

SURVIVAL ON LAND AND SEA, first published in the fall of 1943, includes general, yet detailed, information of survival at sea and living off the land in similar topographical areas of the world; that is, arctic, desert, and landfalls, wet forests, clearings, swamps, grasslands, and river margins of the tropics. This 200-page, 4- by 5-inch booklet is distributed by the Publications Branch of the Office of Naval Intelligence upon requests from commanding officers. To date, 700,000 copies have been made available. BuAer has ordered that 14,000 copies of the manual, with the supplement, be distributed by Air Combat Intelligence officers.

PNEUMATIC RAFT CEMENT

Navy Bureau of Aeronautics Technical Order 112–44 cautions that rubber cement, ASO stock numbers R 52–C–1476 and R 52–C–1478, procured to Army-Navy Aeronautical Specification AN–C–54, type B, is intended only for use in cementing seams, constructing and attaching patches and fabrics and rubber accessories in the manufacture of airships, balloons, floating bags, and pneumatic life rafts. The order emphasizes that it is not for use as a general utility cement in repair and maintenance work. The restriction is said to have been necessary to conserve the critical crude rubber contained in AN–C–54 cement.

FILM REVIEWS

PERSONAL HEALTH IN THE JUNGLE (MA–4586 or TF 8–2057).—This is an Army Medical Corps training film designed to instruct all troops and personnel serving in the jungle areas of the world the individual treatment and sanitary measures for keeping physically well. Weapons are of little help to individuals overcome by tropical ailments. The film discusses each—symptoms, treatment, preventives, and sanitary measures. The soldier carries, as an individual item of equipment, the M–2 Jungle Kit which contains iodine applicators, dressings, wound tablets, band-aids, athletes foot powder, insect repellent, atabrine, and halazone tablets. A typical ailment of personnel unaccustomed to the torrid zones is heat exhaustion. The soldier who travels by foot must guard against athletes foot. All wounds and scratches must be treated immediately in the tropics to ward off infection. Jungle pests, such as ticks, leeches, centipedes, and scorpions add to the discomfort of men and may lead to serious trouble. Field sanitation is extremely important in preventing tropical diseases transmitted by impure water and dysentery-bearing flies. Malaria, its transmission, prevention, and treatment are illustrated.

MALARIA DISCIPLINE (MA–4176 or TF 1–3343).—This comprehensive indoctrination training film prepared by the First Motion Picture Unit of the Army Air Forces, realistically demonstrates the importance of strict control measures for the prevention of the incapacitating tropical disease—malaria. Statistics show that 9 out of 10 men taken prisoner by the Japs from Corregidor were afflicted with malaria; 50 percent of the personnel of a task force in the Southwest Pacific were hospitalized with malaria; only 24 planes of 35 requested by General Montgomery in the North African Campaign were able to be sent out because the crews were down with malaria. Malarial regions are found round the globe within the tropical zones where our military forces are operating—India, West Africa, Burma, Southwest Pacific, and the Caribbean. The film shows by animation how the malaria parasite is transmitted from a diseased individual to a well airman by the blood-sucking anopheles mosquito.

(*Continued on page 28*)

RATIONS

Futcher, Palmer H.
Elgin Field Tests of Rations for AAF type A–1, Airborne Lifeboat. (19 written. (Restricted.)
Keys, Ancel, and Austin F. Henschel.
Life Raft Rations. Report to the Army Air Forces Matériel Command 1944 . . .
Naval Research Institute.
The Tablet Emergency Ration for Lifeboats, Rafts and Floats. (Resea X–127, Report No. 4.) Mimeographed.

RESCUE CRAFT

Kinner Motors, Inc., Glendale, Calif.
Amphibious Rescue Craft. Glendale, Calif., 1944. Processed.
Miami Shipbuilding Corporation, Miami, Fla.
Instruction Book for Operation and Maintenance (of) 63-ft. Miami Aire Boat, Model 152. Miami, Fla., 1942. Rev. ed. (Dec. 1942.) (Restricted.)
Instruction Book for Operation and Maintenance (of) 63-ft. Miami Aire Boat, Model 31½. Miami, Fla., 1943. (Restricted.)

SIGNALS AND SIGNALING

Cohen, Morris.
The Homing Pigeon. Typewritten.
Palmer, C. M.
Emergency Dinghy Transmitter (Notsender NS 2a) Carried in Germa. Photostated.
Potter, Wentworth M.
An Emergency Signaling Mirror Incorporating High Efficiency with Precisi From Illuminating Engineer, April 1944, p. 253–258.
Schneider, Harold W.
"Var-Lite"; a Research Development of the Varniton Company for Practic of Water, Snow, and Ice in the Dark . . .
U. S. Army Service Forces.
Ammunition Group: Pyrotechnics, Military. All Types. 20 June 1944. N. J., Raritan Arsenal) (1944). At Head of Title: Army Service Forces Ca 11 SNL S–5. Ordnance Supply Catalog, Group S, Technical Reference T (Restricted.)
U. S. National Bureau of Standards.
Suggested Specification for Reflex-button Emergency Signaling Mirror. (V D. C., 1944.) Mimeographed. (Restricted.)
U. S. Naval Air Station, Patuxent River, Md.
Bureau of Aeronautics and British Types Emergency Signalling Mirrors-C Test of. TED No. PTR–2523.
U. S. Navy Dept. Bureau of Ordnance.
Aircraft Pyrotechnics: Flares, Photoflash Bombs, Signals, etc., Purpose, and Technical Data. 14 July 1943. Washington, D. C., U. S. Govt. Print. (Restricted.)
U. S. War Dept.
Aircraft Armament and Pyrotechnics. (Its Technical Manual, TM 1–409) (
U. S. War Dept.
Ordnance Maintenance, Pyrotechnic Projectors, all types. 18 March 1943. N. J., Raritan Arsenal) 1943. (*Its* Technical Manual, TM 9–1290.)
U. S. War Dept.
Signal Lamp Equipment, SE–11. 17 April 1943. (Philadelphia, Pa., Greenw Mfg. Co.) 1943. (*Its* Technical Manual, TM 11–392.)
Wilson, C. H.
Mirror Signaling. Los Angeles, Calif., (c1943).

SURVIVAL

Arctic, Desert, and Tropic Information Center.
Army Air Forces; Survival . . . Prepared by Arctic, Desert, and Tropic Center, Army Air Forces Tactical Center. 1944. At Head of Title: Air For No. 21W.
Futcher, Palmer H.
The Shipwrecked. From: The Military Surgeon, February 1944, p. 100–102.
(U. S. Air Transport Command. Alaska Wing.)
Read and Live. (Edmonton, Alberta, Canada, Rescue Office.)
(U. S. Army Air Force, Arctic Training School.)
Arctic Living (by (Technical School and Basic Training Center) Buckley Fi Branch) (Denver, Colo., 1944). Mimeographed.
U. S. Army Air Forces.
Ditching Dope. Air Forces Manual No. 5. Adapted from RCAF "Ditching G
U. S. Army Air Forces. School of Applied Tactics. Air Sea Rescue Unit.
What Would You Have Done? (Restricted.)
U. S. Coast Guard.
Wartime Safety Measures. April 1944.

SURVIVAL ACCOUNTS

Crane, Leon.
I Was Lost 8½ Days in the Arctic. From: American Magazine, August 1944,
Hershey, John.
A Reporter at Large: Survival. From: The New Yorker, June 17, 1944, p. 27
Madden, Paul.
Tragic Voyage, By Lt. Paul Madden as told to Pete Martin, From: Saturd Post, June 10, 1944, p. 16–17; June 17, 1944, p. 22, 83–86.
Sherrod, Robert.
Two Years Alone on Jap-held Guam. From: Life, August 21, 1944, p. 41–44.

TRAINING

Gt. Brit. Royal Air Force. Central Examination Board.
School of Air Sea Rescue Examination—Air Sea Rescue. Mimeographed.
U. S. Army Air Forces. Training Aids Division.
How to Use Training Films.
U. S. Navy Dept. Aviation Training Division.
Taxi Sense.

uggests anifold Device

testing device designed to per functioning of the man- closing the raft seams is detail in Navy Bureau of Technical Note 84–44, 19 44.

is for the benefit of service icerned with the overhaul iance of life rafts. The te says the device can be ically, and illustrates the A note on the illustration

e tester can be made from raft pump R LL–P–562 or in U. S. Navy Air Base and , Philadelphia, catalogue eption of Part No. 7. This igned to make a tighter con- quickly with nozzle on air which should have a short tretched over the end of the

ift manifold testing device cup with an air-pressure The cup is held over the connection, hand pressure nt to prevent leakage be- p rim and the manifold rub- under pressure is let in at he rubber hose connection. on of soap solution at the t indicates whether the unit

permits testing of the man- he raft is undergoing inter-

al note, signed by Rear Ad- Richardson, acting chief of f Aeronautics, says "inas- use of this device will re- ng of man-hours and will functioning of the raft er the raft has been re- recommended that all life and maintenance facil- te the use of this device." t has not been possible to manifolds until the raft ired and all seams closed. leak was discovered after been repaired, seams had l and a new manifold in-

Learned Aiming Device Adopted

The Bureau of Aeronautics has adopted a new glass mirror employing the aiming device developed by Learned. The mirror is known as the Standard Navy Signal Mirror Spec. M–508. It is made of glass with metal backing, on which are mounted eight yellow retro-directive reflex buttons for reflecting a light beam to searching craft at night.

The mirror, stowed in a metal case, is 5 by 4 by 3/16 inches. Another mirror, the M–508a, is being developed by the Bureau of Aeronautics and made by the same manufacturer, the Signal Service Corporation of Irvington, N. J. This signaling mirror is fitted with lugs into which colored filters may be clipped. The total assembly includes mirror, lugs attached, and three filters—orange-red (international orange), red, and green.

FILM REVIEWS

(*Continued from page 27*)

Collective control measures are taken by a survey squad which thoroughly investigates the area where an Air Force camp will be constructed—the case histories at hospitals, number of natives affected, climatic factors, breeding places, native habitations, etc. Once constructed the interiors of all buildings, tents, and barracks are sprayed regularly with the aerosol bomb or hand sprayer and every possible crack or opening is finely screened. However, much of the control of malaria depends upon the individual precautionary measures. To emphasize the importance of wearing protective clothing at dusk and night, carefully inspecting the tent and bed netting before retiring, and taking atabrine regularly, the film shows the routine of two men stationed somewhere in a malaria-infested area. Because of negligence to take his atabrine one of the men was overcome by malaria on a reconnaisance flight and unable to cope with a squadron of attacking Zeros. Although he successfully bailed out a short distance from his home base, he never made it back to camp.

Arctic, Desert, Tropic Branch At Orlando

The offices and personnel of the Arctic, Desert, Tropic Information Center of the Army Air Forces, formerly located in New York City, have moved to the AAF Tactical Center, Orlando, Fla. The unit is now known as the Arctic, Desert, and Tropic Branch of the Tactical Center. As outlined in AAF Regulation No. 20–14, 30 September 1944, the mission of the Branch will be to collect, evaluate, and disseminate information pertaining to AAF activities in arctic, desert, and tropic regions. Under the consolidation, the AAF Tactical Center is charged with the following functions:

1. The AAF Board is charged with the responsibility of testing new matériel, organizations, and equipment used or proposed for use by the Army Air Forces for operational and tactical suitability under simulated combat conditions.

2. The AAF School of Applied Tactics will test new and different tactics and techniques of aerial warfare under simulated combat conditions; and instruct Army and Navy personnel, as assigned, in AAF tactics, techniques, doctrine, and organization.

3. As indicated above, the Arctic, Desert, and Tropic Branch will continue its work in disseminating information concerning the climatic zones in which AAF personnel are operating.

The Assistant Chief of Air Staff, Operations, Commitments, and Requirements, will exercise for the commanding general, AAF headquarters responsibility for coordinating and supervising the activities (including training activities) of the Tactical Center.

BOMB BAY DOOR SUPPORTS

Acting on reports of difficulty in landing the B–24 on the sea, Col. Carl F. Greene, AAF, Matériel Command liaison officer with NACA, and Capt. William P. Carl, Jr., of the same office, have been working on a support system for Liberator bomb bay doors to be fitted when necessity to ditch becomes apparent.

FROSTBITE SEASON

Revival of winter operations emphasizes the importance of a report, from one overseas theater, that frostbite casualties in one week totaled 244.

COMMITTEES FOR AIR SEA RESCUE

1. Committee to Study the Preparation of Emergency and Survival Publications.
   (A. Chm) CG: Lt. J. H. Bell, USCGR[1] ADams 2003 1516 14th St. NW.
   Army: Capt. Thomas Dunn, AC[1], Army 73538 Room 4E 144 Pentagon
   Alt: Maj. K. O. Bennington, Army 74687 AC[1], Room 4E 144 Pentagon
   Navy: Lt. Norville W. White, USNR, Navy 4038 2W30 Bg–W.

2. Committee to Study Adequacy of Air Sea Rescue Facilities.
   (Chm) CG: Comdr. A. E. Harned, ADams 2003 USCG, 1516 14th St. NW.
   Army: Maj. T. J. Borgman, Army 73538 AC, 4E 144 Pentagon.
   Alt: Maj. William J. Small, Army 73538 AC[1], 4E 144 Pentagon.
   Navy: Lt. C. W. Brown, USNR, Navy 61178 Corcoran Annex, Rm. 305.

3. Committee to Study the Communication Facilities and Requirements for Air Sea Rescue.
   (Chm) CG: Capt. E. M. Webster, Navy 4444 USCG, Rm. 7300 CG HQ.
   Army: Capt. J. M. Sherman, AC, Army 4847 4E 144 Pentagon.
   Alt: Maj. T. J. Borgman, AC[1], Army 73538 Rm. 4E 144 Pentagon.
   Navy: Comdr. C. L. Harding, Navy 63636 USCG, Room 2541 Navy Bldg.

4. Committee to Study Special Aircraft Equipment for Rescue and Survival.
   (Chm) CG: Lt. Comdr. J. D. McCubbin, USCG, 1516 14th St. NW. ADams 2003
   Army: Capt. Wilfred Hines, AC[1], Army 74687 4E 144 Pentagon.
   Alt: Capt. Knute Flint, AC[1], Army 4847 4E 144 Pentagon.
   Navy: Lt. (jg) R. J. Willingham, Navy 4038 USNR, 2W32 Bg–W.

5. Committee to Study Primary Life Saving Equipment on Heavily Loaded Transports.
   (Chm) CG: Comdr. R. A. Smyth, Navy 4374 USCGR, Room 8012 CG HQ.
   Army: Major P. P. Fenwick, Army 3C 738 Pentagon.
   Navy: Lt. Comdr. J. L. Caillouet, Navy Jr., USNR, T4–2503.

6. Committee to Study the Medical and Physiological of Air Sea Rescue.
   CG: Sr. Surgeon Paul A., Neal— USPHS, National Institute of Health, Bethesda, Md. WIsco
   Army: Maj. Frederick Fink, M. C. ASF, Room 421, 1818 H St. NW., Chief, Medical Safety Division[1], Office of Flying Safety, HQ, AAF, Winston-Salem, N. C. Army
   Alt: Major Richard Follis, MC,[1] Asst. Chief, Medical Safety Div., Office of Flying Safety, HQ, AAF, Winston-Salem, N. C.
   Navy: Capt. John H. Korb (MC), USN, Room 28 PotAnn Bg–3. Navy
   (Chm) Lt. Comdr. C. F. Gell (MC), USN, Room 2906 Navy Dept. Navy
   RAF: Wing Comdr. P. O. Lee, 1424 16th St. NW. DE 9

7. Committee to Study Ditching Procedures.
   (A. Chm) CG: Comdr. A. E. Harned, USCG, 1516 14th St. NW. ADan
   Army: Maj K. O. Bennington, AC, 4E 144 Pentagon. Army
   Alt: Capt. Thomas Dunn, AC[1], 4E 144 Pentagon. Army
   Navy: Comdr. Harry R. Horney, USN, Room 1802, Navy Bldg. Navy
   RAF: Wing Comdr. R. Bicknell, 1424 16th St. NW. DE 9

[1] These officers have not yet been approved by th for Air Sea Rescue.

No. 3

AIR SEA RESCU

Information contained herein i
United States and foreign sour
this Bulletin for information
addressees with interest in th
It will be apparent that The Bu
mation which does not represe
Rescue Agency or the Service
for Air Sea Rescue.

Published M

By

AIR SEA RESCU

Washington,
August, 1

AIR SEA RESCUE AGENCY
R. R. Waesche, Vice Admiral
U. S. Coast Guard

W.A. BURTON, COMMANDER, USCG
Executive Assistant to Head of Air Sea Rescue Agency

BOARD FOR AIR SEA RESCUE

C. V. Whitney, Colonel	U. S. Army Air Forces.
J. W. Burgard, Lieutenant Colonel	U. S. Army Air Forces.
W. J. Renn, Lieutenant Colonel	U. S. Army Service Forces.
J. W. Harris, Captain	U. S. Navy.
Paul Foley, Jr., Commander	U. S. Navy.

A

AIR SEA RESCUE EQUIPMENT GUIDE

FOREWORD

The August issue (No. 3) of the AIR SEA RESCUE BULLETIN, published monthly by the Air Sea Rescue Agency, Washington, D. C., is devoted entirely to the publication in catalogue form of U. S. Navy (Bureau of Aeronautics) air sea rescue equipment.

The Navy (Bureau of Aeronautics) air sea rescue equipment as set forth in this issue of the BULLETIN, constitutes the first edition of an AIR SEA RESCUE EQUIPMENT GUIDE which, when completed, will be designed to list air sea rescue equipment of

Navy Bureau of Aeronautics
Navy Bureau of Ships
Army Air Forces
U.S. Merchant Marine (as approved by the U.S. Coast Guard)
Royal Air Forces (British)
Royal Canadian Air Forces
A Composite of Pyrotechnics of all Services (which may be used in air sea rescue)

Subsequent sections of the GUIDE will be issued as rapidly as the information can be compiled. In each section the information set forth will be as of the date indicated therein and will be based on the most accurate material available, at the time, from the respective services.

It will be noted that the BULLETIN has been punched so that it may be inserted in loose leaf binders, and that it is so constructed that the staples may be removed.

From time to time, as occasions arise, amendments, modifications, additions and other changes in the equipment, specifications, etc., will be published in the regular editions of the BULLETIN. They will be printed in a form designed to replace appropriate pages in the GUIDE.

For the purposes of this GUIDE, C.F.E. is an abbreviation for CONTRACTOR FURNISHED EQUIPMENT, and G.F.E. is an abbreviation for GOVERNMENT FURNISHED EQUIPMENT.

RESTRIC

CONTENTS

o o o

ILLUSTRATIONS

o o o

Communications to Air Sea Rescue Bulletin should be addressed:

AIR SEA RESCUE BULLETIN
AIR SEA RESCUE AGENCY
1516 FOURTEENTH STREET, N.W.
WASHINGTON, D. C.

ADHESIVE TAPE Adhesive tape, safety pins, and salt tablets are packaged as a unit for Life Rafts and Back Pad Kits but not Shipwreck Kits. Each Unit consists of eight salt tablets, six safety pins, and 5½ yards of ½" adhesive tape. Shipwreck Kits contain adhesive tape and safety pins but no salt tablets. (C.F.E.)

ANCHOR, SEA		
	MARK 2	*R6-A-1960*
	MARK 4	*R6-A-1970*
	MARK 7	*R6-A-1980*
	PARACHUTE TYPE	*R6-A-1950*

One cone type Sea Anchor is provided with each Life Raft. It is secured by a line through a loop on the raft. It is stowed in a manner which permits it to fall into the water upon inflation of the raft. The bucket type sea anchor is for Parachute Rafts. Spec. M-3Q and R, figure V.

BAG, WATER STOWAGE
(See: Water Stowage Bag)

BAILING CUP *R83-C-81505**

A collapsible, rubberized, waterproof fabric cup, approximately 4" in diameter and 4" deep when extended, is secured by a 3-foot cotton line to one of the side straps on the One Man Parachute Type Life Raft. Bailing Sponges may be added. Spec. AN-R-2a.

*When supply is exhausted sponge R83-B-648500 will be substituted.

BAILING SPONGE *R83-B-648500*

These Bailing Sponges have replaced Bailing Cup R83-C-81505. One sponge is provided with each Mark 2 raft, and two sponges are provided with each Mark 4 and Mark 7 raft. They are stowed in the supply pocket. Spec. L-626, Type 2, Size 4.

BATTERIES, FLASHLIGHT *17-B-7210*

These are for use in both flashlights and signal lights. Spec. N-17-B-7.

BLANKETS, WOOLEN *G.F.E.*

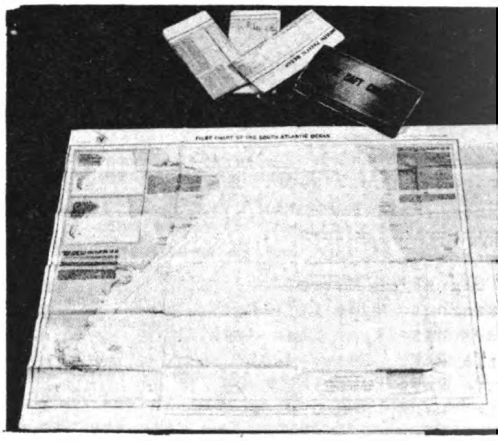
Two woolen blankets 60" wide and 84" long are contained in each Shipwreck Kit. Spec. 27B7b, Type D.

BROTH, CHICKEN
(See: Rations)

CARRYING CASE, LIFE RAFT		
	PARACHUTE TYPE	*R83-*
	MARK 2	*R83-*
	MARK 4	*R83-*
	MARK 7	*R83-*

One case is provided with each raft. tains the raft in a deflated condition closed with snap fasteners, which rele raft from the case when the CO2 cylind discharged. This Carrying Case may be an additional drogue or sea anchor in multi-place rafts.

CHART NAVIGATION SET *R83-*



This item is NOT included in equipment Rafts, but may be ordered separately. charts are folded in a packet and wr an oiled waterproof container. The ch for the following geographic areas:

North Atlantic Ocean	No. 140
South Atlantic Ocean	No. 140
North Pacific Ocean	No. 260
South Pacific Ocean	No. 260

COMPASS, MATCH BOX *R37-C*

One compass is provided with each raft item is a cylindrical plastic case. T fitted with a compass. Safety matches tained in the lower section of the cas suitable striking surface is provided bottom. It is stowed in the supply po the raft.

*Will be replaced by Stock No. R8

CONTAINER, EMERGENCY EQUIPMENT		
	MARK 2	*R83-C-*
	MARK 4	*R83-C-*
	MARK 7	*R83-C-*

One empty container and a ten-foot lin

(Continued on next

RESTRICTE

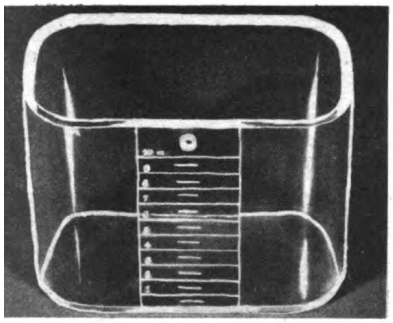
d with a snap hook is provided with
ft. A strip of waterproof tape is al-
ided for sealing the container after
ernment-furnished equipment is stowed
by the activity commissioning the raft.
No. NAF-214715.

ee: Poncho and Sail Protective Cover)

ee: Bailing Cup and Drinking Cup)

NG KIT
ee: Drinking Water Kit)

G CUP *R83-C-81525*



ent plastic cup graduated at each
level. This cup will fit snugly on
om of the rectangular water can.
duation is for use in measuring water

WATER *R51-W-135*

ed can, containing 13½ to 14 fluid oz.
for each man, is stowed in the Emer-
uipment Container. Two cans are pro-
th each Back Pad Kit. Seventeen cans,
ach, are provided with each Shipwreck
. Spec. AN-W-5b.

WATER KIT *R83-K-511000*

containing chemicals for converting
r into drinking water for each man is
stowed in Emergency Equipment Container. The unit is packed in a tin can. Instructions for use are stenciled on the can and its contents. The kit contains chemicals sufficient for making six pints of water. Spec. M-613.

EMERGENCY EQUIPMENT CONTAINER
(See: Container, Emergency Equipment)

FIRST AID KIT

One First Aid Kit for each raft is stowed in Emergency Equipment Container. It contains the following:

- 2 pkgs. bandage compresses
- 1 pkg. burn compound (tannic acid jelly for burns)
- 1 pkg. sterile crystaline sulfanilamide
- 1 pkg., 4 each: morphine syrettes, iodine applicators, ammonic inhalents
- 1 pkg. sulfadiozine, 24 1-gr.tablets

Spec. 57-K-1(INT)

FISH SPEAR

One 8" spear, which is stowed in the handle of an oar, is provided with each raft. One end of the spear is barbed and the other end is constructed so that it may be attached to a metal oar. Spec. S-146.

FISHING KIT *R37-K300*

One fishing kit, shaped and worn like an apron to prevent loss while in use, is provided with each Life Raft. The fishing kit has eight pockets containing the following:

- 100' of 15-lb. nylon line on winder with #6 O'Shaughnessy hook swivel and shot
- 100' of #12 white cotton shore line on winder with stubbed mackerel squid jig mounted on hook with swivel attached
- 100' of #24 white shore line on winder with feather jig mounted on hook with barrel swivel attached
- 12 dehydrated pork rind strips, 4" x ½", with hook holes at each end which may be ordered separately. Stock No. R37-B-200
- Abrasive stone cemented to wooden handle for sharpening hooks
- Commercial fishing knife with 3' lanyard
- Dip net with wooden handle
- 8' fish spear with 25' cord attached
- Complete set of instructions on each item of equipment

Kit is to be stowed in supply pocket. Spec. AN-K-2.

D

FLASHLIGHT, WATERPROOF *17-F-13550*

Shipwreck Kits contain one waterproof flashlight equipped with a spare bulb. Two batteries individually wrapped are also supplied. Spec. 17F7.

GLOVES *C.F.E.*

Cotton work gloves of one size only are furnished with each Back Pad Kit. Spec. 73-C-3a.

HAMMOCK BED			
	MARK 2	33" x 45"	R83-H-5000
	MARK 4	40" x 48"	R83-H-5001
	MARK 7	48" x 39"	R83-H-5002

One hammock bed is provided with each Mark 2 and Mark 4 Raft. Two are provided with each Mark 7 Raft. These hammocks are to be stretched across the raft and supported by the patches on the raft. Spec. M-3R Figure IV.

HAT-HEADNET A combination sun hat and mosquito headnet is under procurement for replacement of mosquito headnets. Future life rafts will be equipped with the hat-headnet, one per man, instead of the mosquito headnet presently included. Spec. M-565a.

HEADNET, MOSQUITO *R83-H-200000*

One Headnet per man is stowed in the Emergency Equipment Container of each Life Raft. The Hat-Headnet will replace this item at a later date. Spec. M-565.

INFLATION CYLINDERS

	Mfgr's. Number	
PARACHUTE TYPE	79667	R51-C-10735
MARK 2	24976	R51-C-8165
MARK 4	24977	R51-C-8175
MARK 7	24978	R51-C-8185

A CO2 Inflation Cylinder is installed outside centerline of each raft abaft the inflation manifold.

INFLATION TUBE, ORAL *R83-T-704150*

An Oral Inflation Tube is used in place of the concertina type pump on the One-Man Raft. The tube is of rubberized or synthetic substitute fabric 16" long, ¼" in diameter with a 1/8" wall. It is provided with a connection to fit the topping-off valve and secured by a chain.

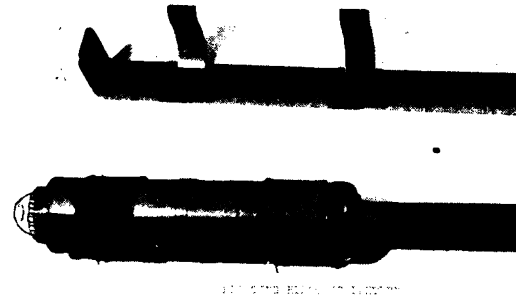
INSTRUCTION BOOKLET *C.F.E.*

One survival (land and sea) manual, printed on waterproof paper, is stowed in the Emergency Equipment Container of each raft. The manual in the Shipwreck Kit is supplemented with a list giving the contents of the kit.

KNIFE *R41-K-*

One jackknife equipped with a 3' lanyard provided with each Life Raft and stowed i supply pocket. This knife is also includ the equipment of the Shipwreck Kit and Ba Kit. Spec. M-575.

LANTERN, FLOATING Standard 17-L-7 *Type-R 17-L-7*



These floating electric automatic lantern designed to supply, when floating, a cont source of light for not less than 22 hour Lanterns are furnished without batteries with a 2.5 volt bulb. They are used as a of locating survivors adrift. Spec. No. 17-L-11b.

Standard and type R lights are different that the R type has a dehydration unit th prevents internal condensation within the

*To be ordered from nearest Navy Yar

LANYARD Flashlight, compass, tle and knife are pro with a 3' cotton lanyard suitable for sec purposes.

LIGHT, ATTACHABLE *17-L-1179*

A small electric one-cell lamp, suitable signal light when attached to life jacket contained in earlier Back Pad Kit models. lamp does not come complete with battery. the discretion of commissioning activity be stowed also in the One Man Parachute T Life Raft and in the Emergency Equipment tainer of the Mark 2, 4, and 7 Rafts. Sp 17-L-16 (small).

LEAK PLUGS *PARACHUTE TYPE R83-P-40* *MARK 2, 4, 7 R83-P-40*

Four sets of nested, shellacked wooden le plugs are stowed in the repair pocket of Mark 2, 4, and 7 Raft. The One Man Parac Type Raft contains two sets of plugs.

RESTRICTED

STS (MAE WEST) *R37-J-150-75*

ic, jacket type, life vest made of rubber fabric and inflated mechanically by two rs of CO_2 gas or orally by an inflation Two life vests Dye Markers are to be used ch vest. Drawing AN 6519, Spec. No. AN-

e: Retaining Line)

)TTON *21-R-150**

of 75-lb. test line is furnished with pwreck Kit, Back Pad Kit and Raft. It ıded for general use. Spec. No. T-R-571. ɔ be ordered from the nearest Naval ıpply Depot.

A jungle utility knife equipped with a 10½" blade i for general use, is contained in each d Kit. Drawing No. BuAer 8662.

T
ee: Life Vests)

ING GLASS *C.F.E.*

approximately 1 3/4" in diameter capable ting a fire by utilizing the rays of the contained in the Back Pad Kit. This s stowed in the pocket together with an in-ɔn booklet and pencil.

SEA
ee: Marker)

ee: Compass Match Box)

ɔ HEADNET
ee: Headnet, Mosquito)

ION CHARTS
ee: Charts)

MARK 2 (5')	R83-0-4010
MARK 4 (5')	R83-0-4010
MARK 7 (6')	R83-0-4020

rovided with each raft, are in three metal s, not exceeding 25" in length. They are in the accessory pockets of multi-place Spec. No. M-162.

C.F.E.

ee-oz. can of oil is provided in each Back Pad Kit to be used as a rust preventive. Spec. AXS-777. This item is to be replaced in future Back Pad Kits by a commercial product known as "Kant Rust" (see M-592 Amendment 1).

OINTMENT
(See: Sunburn Ointment)

ORAL INFLATION TUBE
(See: Inflation Tube)

PADDLES, HAND *R83-P-4800*

Two hand paddles are supplied with each One-Man Parachute Type Life Raft. Paddles are rubberized blue fabric on wire frame; shaped to fit the wrist and held on hand and forearm by webbing bands. Spec. No. AN-R-2b.

PAULIN, LIFE RAFT	MARK 2 (57" x 84")	R83-P-92005
	MARK 4 (72" x 108")	R83-P-92010
	MARK 7 (81" x 132")	R83-P-92020

One paulin is provided with each raft. It is colored sea-blue on one side and orange-yellow on the other. It can be used for weather protection, water collection, camouflage, sail, or signal. It is stowed in accessories pocket of raft. Spec. No. M-616a.

PINS
(See: Adhesive Tape)

PLUGS
(See: Leak Plugs)

PONCHO COVER *C.F.E.*

This item is included in Back Pad Kit. It is designed for use as a weatherproof covering for a man seated in a life raft. Color is sea-blue on one side and orange-yellow on the other. Spec. No. P-61.

PROJECTOR KIT *R83-K-710309*

One signal kit containing a hand projector and six Very cartridges is provided in each life raft, Shipwreck Kit, and Back Pad Kit. This kit is stowed in the Emergency Container of the raft.

PUMP, HAND *R83-P-408500*

One hand pump is provided with each life raft to be used in case of failure of the CO_2 inflation mechanism and to maintain inflation. It is stowed in the accessories pocket and secured thereto by a 3' lanyard. Spec. No. AN-P-48.

RADIO TRANSMITTER ("Gibson Girl") R16-T-9169

(See: page 31)

ED

RATIONS, CHICKEN BROTH *C.F.E.*

Two 12-oz. cans of chicken broth are provided in each Shipwreck Kit.

RATIONS, TABLET *R56-R-6300**

Three cans of tablet rations per man are to be provided in each life raft. The Standard Back Pad Kit also contains three units. Each unit is packed in a copper can with key opener attached. Three cans of rations provide emergency subsistence for one man for six days. Each unit contains the following:

5 sucrose citric acid tablets
10 sucrose lipid citric acid tablets
8 malted milk tablets
2 multivitamin tablets
2 chewing gum tablets
1 waterproof bag for preserving unused portion of rations

Rations are to be stowed in emergency equipment container. Spec. No. 539b.

*Emergency rations "K" Stock No. R56-R-6125 will be supplied until present stocks are exhausted.

RATIONS, TOMATO JUICE *C.F.E.*

Two 12-oz. cans of tomato juice are provided in each Shipwreck Kit.

REPAIR KIT *PARACHUTE TYPE* *R83-K-710165*
MARK 2, 4, 7 *R83-K-710150*

One repair kit is provided with each raft and stowed in the repair pocket. The kit contains:

Patching material
Tire patches
Rubber cement
Roughing tool
Pliers
Scissors

Spec. No. AN-C-54

RETAINING LINE *R83-L-332760*

One retaining line is provided with each raft for purpose of securing raft to user and to prevent loss after inflation. The retaining line consists of 10' of ¼" cotton line, one end of which is secured to the raft and the other secured to the life vest by means of a snap hook. The line is folded inside the carrying case with the snap hook emerging near the CO2 inflation handle.

SAIL, OR PROTECTIVE COVER *R83-C-76950*

Rubberized waterproofed fabric approximately 54" square, orange-yellow on one side, sea-blue on other. It is used in life rafts as a protective cover or sail. The item is not included as equipment for life rafts but may be or separately. Drawing AN-6521.

SALT TABLETS
(See: Adhesive Tape)

SEA ANCHOR
(See: Anchor)

SEA MARKER *R37-P-*

Three life jacket dye markers are provide each life raft and are stowed in the Emer Equipment Container. The Sea Marker, whe mersed and dissolved in water, produces a green color over a large area which can b at a distance. Six packages of Sea Marke contained in each Shipwreck Kit. Two dye ers are affixed to the individual life ve Spec. M-566.

*Will replace Sea Marker, Stock No. M-1060500.

SHARK REPELLENT *LIMIT*

The Bureau of Aeronautics has purchased 2 units of Shark Repellent for field tests. Further investigation is being carried ou the result of preliminary test.

SHARPENING STONE *C.*

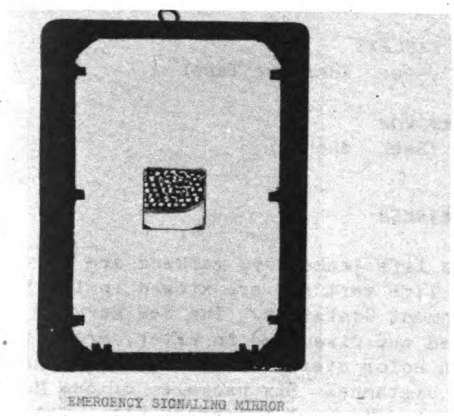
One sharpening stone, unmounted, 4" x 4½", included in each Back Pad Kit. Spec. No. S-736, Type II, Class A or B.

SHOULDER HOLSTER 38 Cal. 71609
45 Cal. M7-71111

Shoulder holster for the standard issue o caliber revolver is standard equipment fo each pilot. Shoulder holsters for the Co .45 caliber automatic are issued through U. S. Army Ordnance.

RESTRICTED

.ING MIRROR *R83-M-525525*



EMERGENCY SIGNALING MIRROR

naling mirror is supplied with each
d Kit and each raft. In the raft this
is stowed in the supply pocket. The
is waterproof, 5" x 4" x 3/16", and is
reflect the sunlight as far as ten
Complete instructions are printed on
k. New and improved types of mirrors
en developed to replace this item, the
d glass mirror, Spec. M-580, and the
d Learned type, Spec. M-580a.

RENADES Two smoke grenades, Type M-8, are furnished with
fe raft. They are stowed in the emer-
quipment container. Two grenades are
cluded in the Shipwreck Kit. The gre-
re BuOrd. items and can be ordered
e nearest ammunition depot. Smaller,
ld, colored smoke signals have been de-
to replace the M-8 grenade.

H-C SMOKE GRENADE HOLDING CLAMP R83-C-44600

One holding clamp is provided with each raft. The clamp can be attached to the handle of an oar by means of a wing nut clamp. It is stowed in the supply pocket of the raft.

SPEAR
(See: Fish Spear)

SPONGE
(See: Bailing Sponge)

SUNBURN OINTMENT *C.F.E.*

Two 4-oz. tubes of sun-protective ointment P-40469 are included in the Shipwreck Kit and one can of ointment is included in each Back Pad Kit.

WATER, EMERGENCY DRINKING
(See: Drinking Water)

WATER STOWAGE BAG *R83-B-30175*

Two water stowage bags are provided for each Mark 2 Raft and four are provided for each Mark 4 and 7 Raft. These plastic bags are used to collect and store five quarts of fresh water. They are stowed in the Emergency Equipment Container. Drawing 8985.

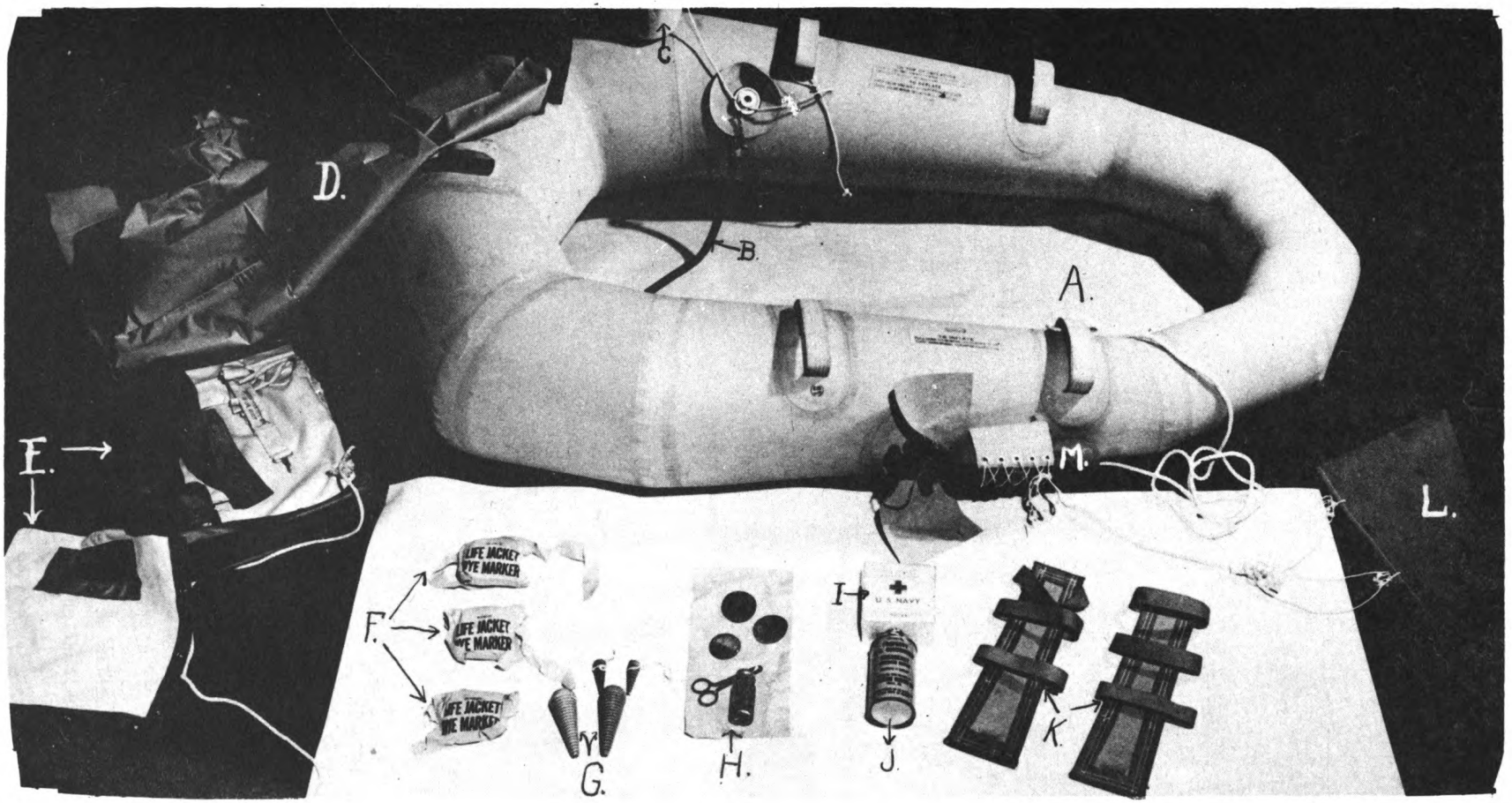
WATERPROOF FLASHLIGHT
(See: Flashlight)

WHISTLE *R42-W-24000*

One plastic whistle is provided with each Raft, Shipwreck Kit, and Back Pad Kit. Each whistle has a lanyard attached for securing it around the neck of the user.

TED

ONE-MAN PARACHUTE TYPE LIFE RAFT, SPEC. AN-R-2a



A One (1) Man Parachute Type Life Raft
B Oral Inflation Tube
C Collapsible Bailing Cup
D Sail
E Seat Pack Container
H Repair Kit
I First Aid Kit
J Emergency Drinking Water
K Hand Paddles
L Sea Anchor

ONE-MAN PARACHUTE TYPE LIFE RAFT

Stock No.	R83-R-15650
Specification No.	AN-R-2b (See Note)
Classification No.	83
Shipping Data	Shipped complete with accessories
Drawing No.	AN 6520-1
Color	Orange-yellow
Weight	13½ lbs.
Dimensions	Inflated: 66" long, 40" wide, 12" freeboard Packed: 15" long, 14" wide, 4" high

The One-Man Parachute Type Life Raft may be used with either the seat type parachute or the quick attachable chest type parachute. When used with the seat type parachute it is stowed between the parachute and the user's body in place of the parachute seat cushion. When used with the quick attachable chest type parachute it is stowed in a case and is located between the QAC parachute and the user's body.

complete, or the accessories listed below, are available to all activities. When order-
cify: (a) quantity desired, (b) stock number, (c) specification number, (d) classifica-
ber.

	Stock Number	Specification Number	Class. No.
eumatic, Life, One-Man Parachute e, Complete	R83-R-15650	AN-R-2b	83
contains the following accessories:			
e, Carrying	R83-C-8450	"	83
inder and Valve Assembly	R83-C-94070	"	83
hor, Sea	R6-A-1950	"	6
, Bailing	R83-C-81505	"	83
, First Aid	R57-K-8525	M&S 57-K-1(INT)	57
, Repair	R83-K-710165	AN-R-2b	83
dles, 2 per raft	R83-P-4800	"	83
gs, Leak, 4 per raft	R83-P-408500	"	83
rgency Drinking Water, 12-oz. can	R51-W-135	AN-W-5b	51
l Inflation Tube	R83-T-704150	AN-R-2b	83
e Jacket Sea Marker	R37-P-25	M-566	83

Note: There have been no major design changes in the raft under the specifications M-524, AN-R-2, AN-R-2a, and AN-R-2b. The AN-R-2a raft contains a sail whereas the AN-R-2b raft has none.

ONE-MAN PARACHUTE TYPE LIFE RAFT

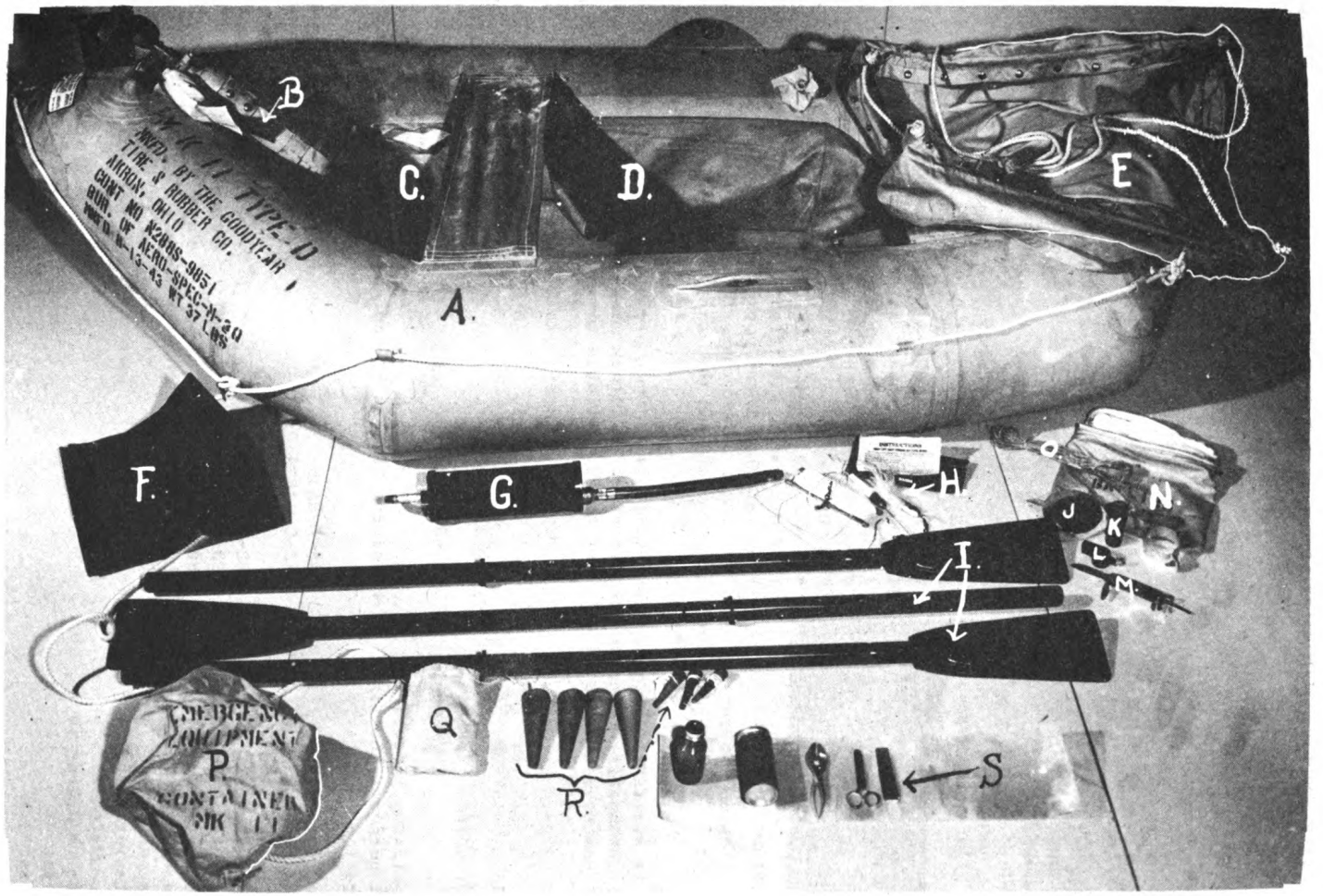
lity

Man Parachute Type Life Rafts have been delivered and are available to all activities in quantities. Shipments are being made by the contractor to the supply depots listed below stribution.

Activity	Quantity
N.A.S.D. Philadelphia	4084
N.A.S.D. Norfolk	8000
A.S.A. - N.S.D. Oakland	11500

TED

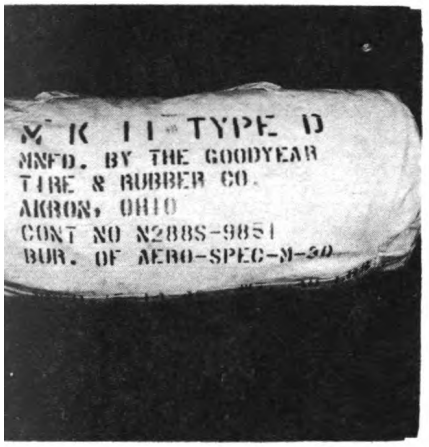
MARK II LIFE RAFT, SPEC. M-3Q



A Mark 2 M-3Q Life Raft
B CO2 Inflation Cylinder
C Repair Pocket
D Supply Pocket
G Hand Pump
H Fishing Kit
I Oars
J Signaling Mirror
M Jackknife
N Accessories Pocket
O 25' of 75# Line
P Equipment Container

LIFE RAFT, PNEUMATIC, DROPPABLE TYPE, MARK II (2 man)

MARK II LIFE RAFT CARRYING CASE, SPEC. M-3Q OR M-3R



LIFE RAFT CARRYING CASE

Stock No.	R83-R-15510
Specification No.	M-3Q and M-3R (See schedule below)
Shipping data	Shipped complete with accessories
Color	Orange-yellow
Weight	M-3Q, 55 lbs.; M-3R, 55 lbs.
Dimensions	Inflated: 7½' long, 4' beam, 13" freeboard Packed: 30" long, 12" diameter
2 Seats	

Life rafts are intended for use in naval aircraft as life-saving equipment at sea. The Mark number specified is the rated passenger carrying capacity for each raft. There are three types of rafts: Type A, Automatic, Type D, Droppable; Type S, Standard. The difference between these types is in the inflation device only. Unless otherwise specified, Type D rafts will be furnished. Each raft has three pockets in which is stowed emergency
t. The complete equipment for each raft comes in two cases fastened together by a lanyard.
contains the raft with equipment in the pockets and the other contains emergency equipment
st be kept waterproof until used.

lete raft is available for immediate distribution. When ordering specify: (a) quantity (b) type: Droppable, Standard or Automatic, (c) stock number, (d) specification number, sification number. The Mark II Life Rafts are available to the activities as listed below.

	Stock No.	Specification Number	Class. No.
eumatic, Droppable, MARK II, plete	R83-R-15510	M-3Q	83
ins the following accessories: lenishment purposes individual items of the kit can be replaced by using the following d specification numbers.)			
rying Case	R83-R-8510	M-3Q	83
inder Valve Assembly	R83-C-94674	M-3Q	83
tainer only (for stowing waterproof equipment)	R83-C-66755	M-3Q	83
s, 3 - 5 ft.	R83-O-4010	M-162	83
let Hole Plugs, 8 per raft	R83-P-408500	M-3R, ANC-54	83
air Kit in repair pocket	R83-K-710160		
Kit contains:			
Patching Material			
Tire Patches			
Metal Roughing Tool			
Pliers			
Scissors			
Supply Pocket:			
Hand Pump	R83-P-408500	AN-P-48	11
Sail, 1	R83-C-76950	M-551	83
Fishing Kit	R37-K-300	M-552	37
Match Box Compass	R37-C-2500	M-554	37
Smoke Grenade Holding Clamp	R83-C-44600	M-3Q	83
Signaling Reflector	R83-R-205000	M-3Q	83
Knife	R41-K-365	M-3Q	41
Whistle	R-42-W-24000	M-3Q	42
Line 25' - 75# test	21-R-150	M-3Q	None

D

	Stock. No.	Specification Number	Class
In Emergency Equipment Container:			
First Aid Kit	R57-K-8525	M&S57-K-L(INT)	5
Rations	R56-R-6125	M-539b	5
Emergency Drinking Water	R51-W-135	AN-W-5b	5
Dye Markers	R83-M-160500	M-528	8
H-C Smoke Grenades, 2 per raft	R83-G-770100	M-3	8
Pyrotechnic Signal Kit	R83-K-710309	M-3	8
Mosquito Headnet	R83-H-200000	M-565	2

M-3R

Item

Raft, Life, Pneumatic, Droppable, MARK II Complete	R83-R-15510	M-3R	8

It contains the following accessories:
(For replenishment purposes individual items of the kit can be replaced by using the follow stock and specification numbers.)

In Supply Pocket:			
Hand Pump	R83-P-408500	AN-P-48	8
Oars (containing Fish Spear) 5 ft. - 2	R83-O-4010	M-162	8
Hammock Bed	R83-H-5000	M-3R-figure 4	8
Life Raft Paulin	R83-P-92005	M-616	8
Bailing Sponge	R83-B-648500	L-S-626, Type II, size 4	8
Life Raft Fishing Kit	R37-K-300	AN-K-2	3
Life Raft Match Box Compass	R37-C-2500	AN-C-101	3
H-C Smoke Grenade Holding Clamp	R83-C-44600	M-3R-D-3a	8
Signaling Mirror	R83-M-525525	M-580, size 2	8
Knife	R41-K-365	M-575	4
Whistle	R42-W-24000	M-3R, D-3a(10)	4
Note: Supply Pocket may be fashioned into a bucket.			
Repair Kit in repair pocket	R83-K-710150	AN-C-54	8
Kit contains:			
Patching Material			
Tire Patches			
Rubber Cement			
Metal Roughing Tool			
Pliers			
Wire Cutters			
Screw Driver			
Emergency Equipment Container (to be packed by the activity that places raft in commission)	R83-C-66755	Drawing NAF-214715	8
Contains:			
First Aid Kit	R57-K-8525	57-K-1(INT)	5
Life Raft Tablet Rations, 3 per man	R56-R-6300	M-5396	5
Emergency Drinking Water, 1 can per man	R51-W-135	AN-W-56	5
Drinking Water Kit, 1 per man	R83-K-511000	M-613	8
Water Storage Bag, 1 per man	R83-B-30175	Drawing 8985	8
Dye Markers, 3	R37-P-25	M-566	3
H-C Smoke Grenades, 2		(Spec. No. BuOrd, Type M-8)	
Red Very Cartridges, 6			
Projector Kit	R83-K-710309	M-3R, D-3b(8)	8
Mosquito Headnet	R83-H-200000	M-565	8
Instruction Booklet		M-3R, D-3b(10)	8

(continued on next

	Stock No.	Specification Number	Class. No.
fe Raft Carrying Case	R83-C-8510		83
a Anchor	R6-A-1960	M-3R figure 5	6
ak Plugs (8 in all)	R83-P-408500	M-3R, D-3a(14)	83
sh Spear	R83-S-648150	S-146	83
ıe 25' - 75# test	21-R-150		21
) Inflation Cylinder	R51-C-8165	M-3R, D-2b	51

ılity

Requisitioning activities will use stock number R83-R-15510 when requisitioning the Mark Raft. The rafts manufactured under specification M-3Ϛ are available to the activities at sent time. However, life rafts manufactured under specification M-3R are under procurement ɔrding to the contracts with manufacturers deliveries will commence July, 1944. As the ion is slow on the M-3R rafts, deliveries are several months behind schedule. At the time R rafts are available to the activities the supply officers will deliver either the M-3Ϛ's M-3R's under the above stock number. When both types are available, unless otherwise spe- ɔy the requisitioning activity, the M-3Ϛ rafts will be exhausted before the M-3R rafts are

, M-3Ϛ

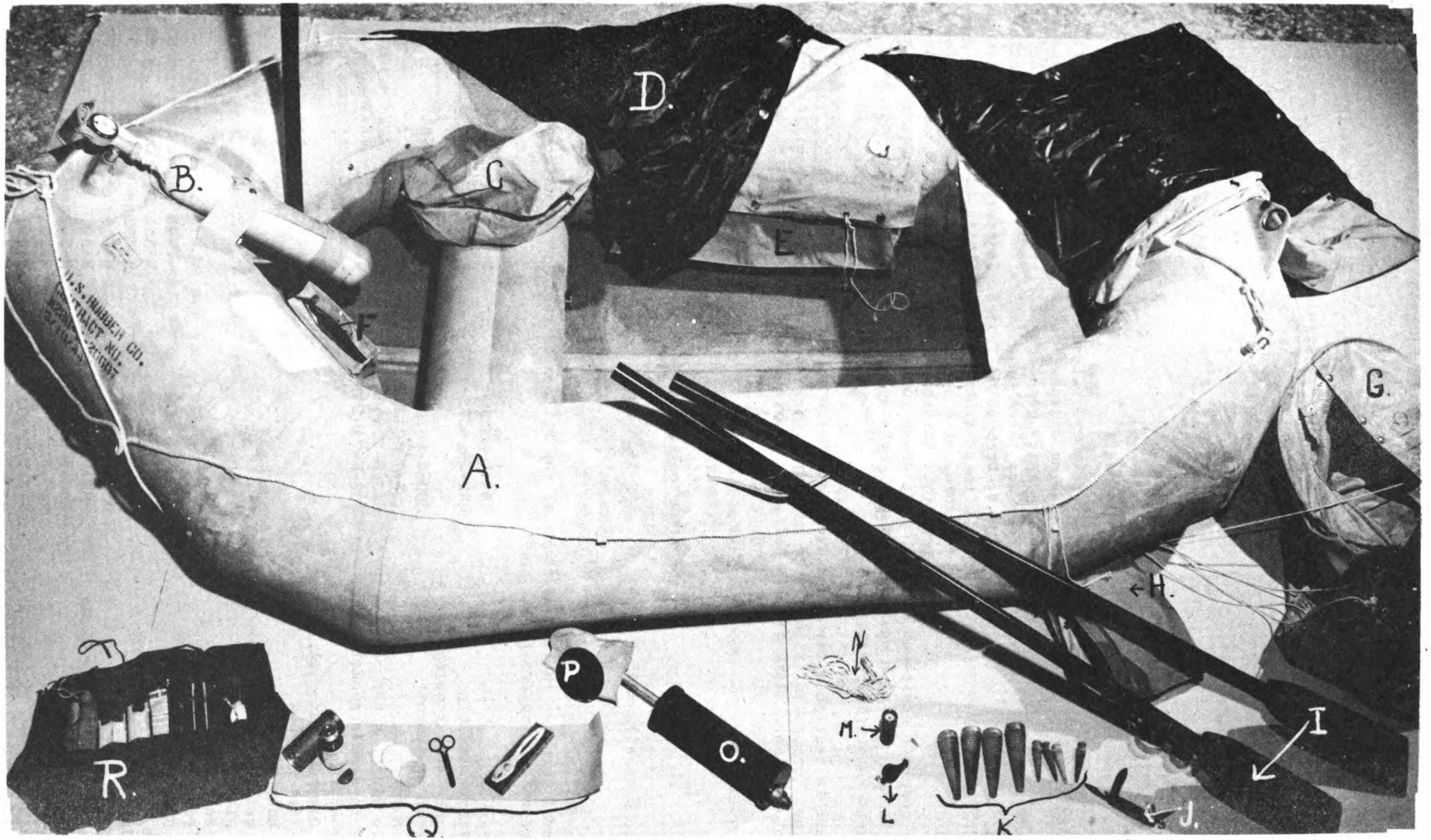
fts have been delivered and are available to all activities in limited quantities. Ship- re being made by the contractor to the supply depots listed below for redistribution.

Activity	Quantity
N.A.S.D. Philadelphia	7634

(Manufacturers have complied with requests by the bureau to stop production of M-3Ϛ rafts and manufacture M-3R rafts for the balance of existing contract requirements.)

N.A.S.D. Norfolk	1500
A.S.A. - N.S.D. Oakland	5250

MARK IV LIFE RAFT, SPEC. M-3Q



A Mark 4 M-3Q Life Raft
B CO2 Inflation Cylinder
F Accessories Pocket
G Carrying Case
K Leak Plugs
L Whistle
P Signaling Mirror
Q Repair Kit

MARK IV LIFE RAFT CARRYING CASE, SPEC. M-3Q OR M-3R

Stock No.	R83-R-15530
Specification No.	M-3Q and M-3R (see schedule below)
Shipping Data	Shipped complete with accessories
Color	Orange-yellow
Weight	M-3Q, 82 lbs., M-3R, 82 lbs.
Dimensions	Inflated: 9'2" long, 5' wide, 15½" freeboard Packed: 34" long, 14" diameter
	2 Seats

Life rafts are intended for use in naval aircraft as lifesaving equipment at sea. The Mark number specified is the rated passenger carrying capacity for each raft. There are three types of rafts: Type A, Automatic; Type D, Droppable; Type S, Standard. The difference between these types is in the inflation device only. Unless otherwise specified, Type D rafts will be furnished. Each raft has three pockets in which is stowed emergency

nt. The complete equipment for each raft comes in two cases fastened together by a lanyard.
e contains the raft with equipment in the pockets and the other contains emergency equipment.
ust be kept waterproof until used.

plete raft is available for immediate distribution. When ordering specify: (a) quantity
, (b) type: Droppable, Standard or Automatic, (c) stock number, (d) specification number,
ssification number. Mark IV Life Rafts are available to the activities as listed below.

	Stock No.	Specification Number	Class. No.
neumatic, Droppable MARK IV lete	R83-R-15530	M-3Q	83
ains the following accessories: plenishment purposes individual items of the kit can be replaced by using the following nd specification numbers.)			
rrying Case	R83-C-8530	M-3Q	83
linder Valve Assembly	R83-C-94675	M-3Q	83
ntainer only (for stowing waterproof equipment)	R83-C-66765	M-3Q	83
rs, 3 - 5 ft.	R83-O-4010	M-162	83
llet Hole Plugs, 8 per raft	R83-R-408500	M-3Q	83
pair Kit in repair pocket	R83-K-710150	M-3Q	83
Kit contains:			
Patching Material			
Tire Patches			
Rubber Cement			
Metal Roughing Tool			
Pliers			
Scissors			
Supply Pocket:			
Hand Pump	R83-P-408500	AN-P-48	83
Sails, 2 per raft	R83-C-76950	M-551	83
Fishing Kit	R37-K-300	M-552	37
Match Box Compass	R37-C-2500	M-554	37
Smoke Grenade Holding Clamp	R83-C-44600	M-3Q	83
Signaling Reflector	R83-R-205000	M-3Q	83
Knife	R41-W-365	M-3Q	41
Whistle	R42-W-24000	M-3Q	42
Line 25' - 75# test	21-R-150	M-3Q	None

(Continued on next page)

	Stock No.	Specification Number	Class.
In Emergency Equipment Container:			
First Aid Kit	R57-K-8525	M&857-K-1(INT)	5
Rations	R56-R-6125	M-539	5
Emergency Drinking Water	R51-W-135	AN-W-5	5
Dye Markers	R83-M-160500	M-528	8
H-C Smoke Grenades, 2 per raft	R83-G-770100	M-34	8
Pyrotechnic Signal Kit	R83-K-710309	M-34	8
Mosquito Headnet	R83-H-200000	M-565	2

M-3R

Item

Raft, Pneumatic, Droppable, MARK VII Complete	R83-R-15530	M-3R	8

It contains the following accessories:
(For replenishment purposes individual items of the kit can be replaced by using the followi stock and specification numbers.)

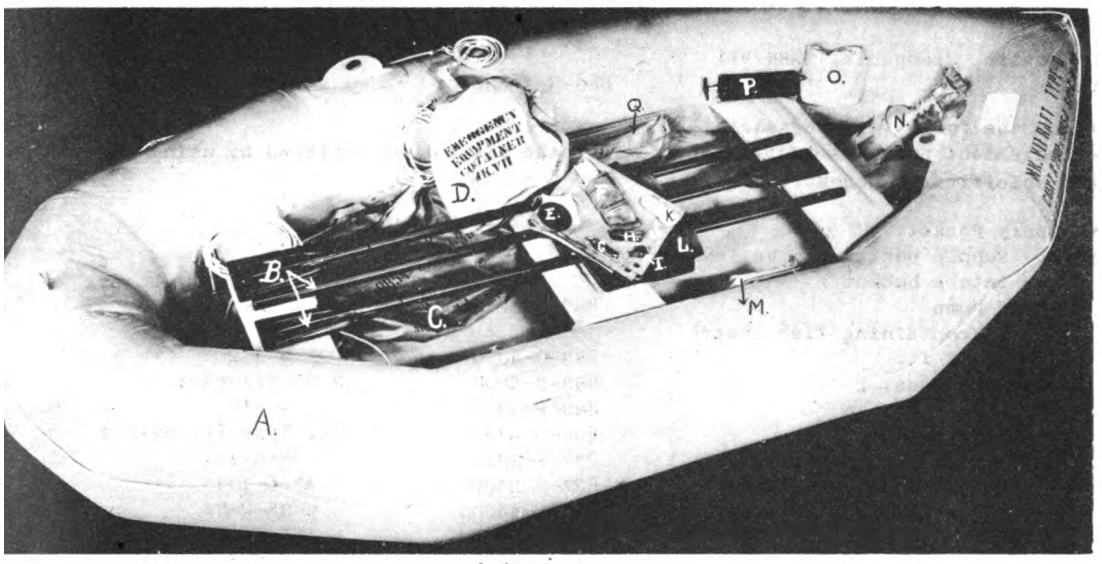
In Supply Pocket:			
(Note: Supply pocket may be fashioned into a bucket.)			
Hand Pump	R83-P-408500	AN-P-48	8
Oars (containing fish spear) 3 - 6 ft.	R83-O-4020	M-162	8
Hammock Beds, 2	R83-H-5000	M-3R-figure 4	8
Life Raft Paulin	R83-P-92005	M-616	8
Bailing Sponge	R83-B-648500	L-S-626, Type II, size 4	8
Life Raft Fishing Kit	R37-K-300	AN-K-2	3
Life Raft Match Box Compass	R37-C-2500	AN-C-101	3
H-C Smoke Grenade Holding Clamp	R83-C-44600	M-3R-D-3a	8
Signaling Mirror	R83-M-525525	M-580, size 2	8
Knife	R41-K-365	M-575	4
Whistle	R42-W-24000	M-3R, D-3a(10)	4
Repair Kit in repair pocket	R83-K-710150	AN-C-54	8
Kit contains: Patching Material, Tire Patches, Rubber Cement, Metal Roughing Tool, Pliers, Wire Cutters, Screw Drivers			
Emergency Equipment Container (to be packed by the activity that placed raft in commission)	R83-C-66775	Drawing NAF-214715	8
Contains:			
First Aid Kit	R57-K-8525	57-K-1(INT)	5
Life Raft Tablet Rations, 3 per man	R56-R-6300	M-5396	5
Emergency Drinking Water, 1 can per man	R51-W-135	AN-W-56	5
Drinking Water Kit, 1 per man	R83-K-511000	M-613	8
Water Storage Bag, 1 per man	R83-B-30175	Drawing 8985	8
Dye Markers, 3	R37-P-25	M-566	3
H-C Smoke Grenades, 2		BuOrd Type M8	
Red Very Cartridges, 6			
Projector Kit	R83-K-710309	M-3R, D3b(8)	8
Mosquito Headnet	R83-H-200000	M-565	8
Instruction Booklet		M-3R, D3b(10)	

(Continued on next pa

RESTRICTED

	Stock No.	Specification Number	Class. No.
.fe Raft Carrying Case	R83-C-8550		83
;a Anchor	R6-A-1960	M-3R figure 5	6
;ak Plugs (8 in all)	R83-P-408500	M-3R, D-3a(14)	83
.sh Spear	R83-S-648150	S-146	83
.ne 25' - 75# test	21-R-150		21
$)_2$ Inflation Cylinder	R51-C-8185	M-3R, D-2b	51

MARK VII LIFE RAFT, SPEC. M-3Q



7 (7 MAN) LIFE RAFT M-3Q
RAFT CARRYING CASE
GENCY EQUIPMENT CONTAINER

E SIGNALING MIRROR
F FISHING KIT
G JACKKNIFE
H COMPASS MATCH BOX
I WHISTLE
K 25 FT OF 75# TEST LINE
L SAIL 2 PER RAFT
M ACCESSORIES POCKET
N INFLATION CYLINDER CO_2
O REPAIR POCKET
P HAND PUMP
Q SUPPLY POCKET

lity

tequisitioning activities will use stock number R83-R-15570 when requisitioning the Mark Raft. The rafts manufactured under specification M-3Q are available to the activities at sent time. However, life rafts manufactured under specification M-3R are under procurement ording to the contracts with manufacturers deliveries will commence July, 1944. As the ion is slow on the M-3R rafts, deliveries are several months behind schedule. At the time t rafts are available to the activities the supply officers will deliver either the M-3Q's 1-3R's under the above stock number. When both types are available, unless otherwise spec- the requisitioning activity, the M-3Q rafts will be exhausted before the M-3R rafts are

M-3Q

ts have been delivered and are available to all activities in limited quantities. Ship- e being made by the contractor to the supply depots listed below for redistribution.

Activity	Quantity
N.A.S.D. Philadelphia	7500
N.A.S.D. Norfolk	3750

ufacturers have complied with requests by the bureau to stop production of M-3Q s and manufacture M-3R rafts for the balance of existing contract requirements.)

N.A.S.D. Philadelphia	7500
N.A.S.D. Norfolk	6750
ASA - N.S.D. Oakland	6000

RESTRICTED

CONTENTS OF STANDARD BACK PAD KIT, SPEC. M-592

BACK PAD KIT

Stock No.	R83-K-520100
Classification No.	83
Shipping Data	Shipped complete with accessories, 10 kits to carton.

Kits are intended for use in conjunction with One-Man Parachute Type Life Rafts. It is
er the parachute harness and life jacket. Sufficient equipment is contained therein to
llots or personnel forced down at sea or in the jungle to meet the problems with emergency
t. There are three (3) types of Back Pad Kits: (1) the Original Back pad Kit, (2) the
Back Pad Kit, (3) the Standard Back Pad Kit, as listed below.

and accessories are available to the activities according to availability schedules. When
, specify: (a) quantity desired, (b) stock number, (c) specification number, (d) classifi-
mber.

BACK PAD EQUIPMENT KIT (KIDNEY SHAPED)

Stock No.	R83-K-520100
Specification No.	Note: No specifications are being prepared on this type of kit. Deliveries of this kit have been made to service activities under Contract N288s-10807, dated 6 April, 1943, for 20,000 units.

lance with reports received from service indicating the need for reduced thickness, the
s making available to the supply points under Contract N288s-17021 sets of modification

	Stock No.	Specification Number	Class. No.
Back Pad Equipment Kit, ete	R83-K-520100		83

lns the following accessories:
lenishment purposes individual items of the kit can be replaced by using the following
i specification numbers.)

rgency Drinking Water	R51-W-135	AN-W-5b	51
e Raft Tablet Rations	R56-R-6300	M-539b	56
ıing Kit	R37-K-300	AN-K-2	37
ɔass and Match Container	R37-C-2500	AN-C-101	37
inet and Fish Seine	R27-N-261	M-565	27
of 75# test line	21-R-150	None	21
ɔtechnic Kit	R83-K-710309	None	21
c Knife	R41-K-365	None	41
stle	R42-W-24000	None	42
ıaling Mirror	C.F.E.	C.F.E.	C.F.E.
t Tablets	"	"	"
esive Tape	"	"	"
ety Pins	"	"	"
l	"	"	"
colate Bar Type D Rations	"	"	"
ıican	G.F.E.	G.F.E.	G.F.E.
ıaling Light	C.F.E.	C.F.E.	C.F.E
re Battery & Bulb	"	"	"
truction Book	"	"	"

BACK PAD KIT

ied Back Pad Kit is identical to the Original Back Pad Kit (Kidney Shaped), with the ex-
f thickness. The changes in the kit were authorized by Bureau of Aeronautics under Con-
3s-17021 for sets of modification material, together with instructions and diagrams nec-
reduce the thickness of these kits.

D

	Stock No.	Specification Number	Cls
In Emergency Equipment Container			
First Aid Kit	R57-K-8525	M&S57-K-1(INT)	
Rations	R56-R-6125	M-539	
Emergency Drinking Water	R51-W-135	AN-W-5	
Dye Markers	R83-M-160500	M-528	
H-C Smoke Grenades, 2 per raft	R83-G-770100	M-3Q	
Pyrotechnic Signal Kit	R83-K-710309	M-3Q	
Mosquito Headnet	R83-H-200000	M-565	

M-3R
Item

Raft, Pneumatic, Droppable, MARK IV Complete	R83-R-15530	M-3R
It contains the following accessories:		
(For replenishment purposes individual items of the kit can be replaced by using the follo stock and specification numbers.)		
In Supply Pocket: (Supply Pocket may be fashioned into a bucket.)		
Hand Pump	R83-P-408500	AN-P-48
Oars (containing fish spear) 5 ft. - 2	R83-O-4010	M-162
Hammock Bed	R83-H-5000	M-3R-figure 4
Life Raft Paulin	R83-P-92005	M-616
Bailing Sponge	R83-B-648500	L-S-626, Type II, size 4
Life Raft Fishing Kit	R37-K-300	AN-K-2
Life Raft Match Box Compass	R37-C-2500	AN-C-101
H-C Smoke Grenade Holding Clamp	R83-C-44600	M-3R-D-3a
Signaling Mirror	R83-M-525525	M-580, size 2
Knife	R41-K-365	M-575
Whistle	R42-W-24000	M-3R, D-3a (10)
Repair Kit in repair pocket	R83-K-710150	AN-C-54
Kit contains: Patching Material, Tire Patches, Rubber Cement, Metal Roughing Tool, Pliers, Wire Cutters, Screw Drivers		
Emergency Equipment Container (to be packed by the activity that places raft in commission)	R83-C-66765	Drawing NAF-214715
Contains:		
First Aid Kit	R57-K-8525	57-K-1(INT)
Life Raft Tablet Rations, 3 per man	R56-R-6300	M-5396
Emergency Drinking Water, 1 can per man	R51-W-135	AN-W-56
Drinking Water Kit, 1 per man	R83-K-511000	M-613
Water Storage Bag, 1 per man	R83-B-30175	Drawing 8985
Dye Markers, 3	R37-P-25	M-566
H-C Smoke Grenades, 2		(BuOrd Type M8)
Red Very Cartridges, 6	R83-K-71039	M-3R, D-3b(8)
Mosquito Headnet	R83-H-200000	M-565
Instruction Booklet		M-3R, D-3b(10)
Life Raft Carrying Case	R83-C-8510	
Sea Anchor	R6-A-1960	M-3R figure 5
Leak Plugs (8 in all)	R83-P-408500	M-3R, D-3a(14)
Fish Spear	R83-S-648150	S-146
Line 25' - 75# test	21-R-150	
CO_2 Inflation Cylinder	R51-C-8165	M-3R, D-2b

EMERGENCY EQUIPMENT CONTAINER FOR MARK IV LIFE RAFT, SPEC. M-3Q

A RATIONS
B EMERGENCY EQUIPMENT CONTAINER
C MOSQUITO HEADNET
D EMERGENCY DRINK WATER
E H-C SMOKE GRENADES
F DYE, SEA MARKER
G PYROTECHNIC PROJECTOR (HAND)
H FIRST AID KIT

lity

equisitioning activities will use stock number R83-R-15530 when requisitioning the Mark Raft. The rafts manufactured under specification M-3Q are available to the activities at ent time. However, life rafts manufactured under specification M-3R are under procurement rding to the contracts with manufacturers, deliveries will commence July, 1944. As the on is slow on the M-3R rafts, deliveries are several months behind schedule. At the time rafts are available to the activities the supply officers will deliver either the M-3Q's -3R's under the above stock number. When both types are available, unless otherwise d by the requisitioning activity, the M-3Q rafts will be exhausted before the M-3R rafts ed.

-3Q

ts have been delivered and are available to all activities in limited quantities. Ship- e being made by the contractor to the supply depots listed below for redistribution.

Activity	Quantity
N.A.S.D. Philadelphia	5481
N.A.S.D. Norfolk	2500
ASA - N.S.D. Oakland	2500

(Manufacturers have complied with requests by the bureau to stop production of M-3Q rafts and manufacture M-3R rafts for the balance of existing contract requirements.)

N.A.S.D. Norfolk	1500
ASA - N.S.D. Oakland	1500

s have been awarded to procure M-3R rafts for delivery as follows:

ASA - N.S.D. Oakland	5000

RESTRICTED

MARK VII LIFE RAFT, SPEC. M-30

REST

LIFE RAFT, PNEUMATIC, DROPPABLE TYPE, MARK VII (7 man)

: VII LIFE RAFT CARRYING CASE, SPEC. M-3Q OR M-3R

LIFE RAFT CARRYING CASE

Stock No.	R83-R-15570
Specification No.	M-3Q and M-3R (See schedule below)
Classification No.	83
Shipping Data	Shipped complete with accessories
Color	Orange-yellow
Weight	M-3Q, 112 lbs; M-3R, 112 lbs.
Dimensions	Inflated: 12' long, 5½' wide, 16" freeboard Packed: 36" long, 15" diameter
	3 Seats

Life rafts are intended for use in naval aircraft as life saving equipment at sea. The Mark number specified is the rated passenger carrying capacity for each raft. There are three types of rafts: Type A, Automatic; Type D, Droppable; Type S, Standard. The difference between these types is in the inflation device only. Unless otherwise specified, Type D rafts will be furnished.

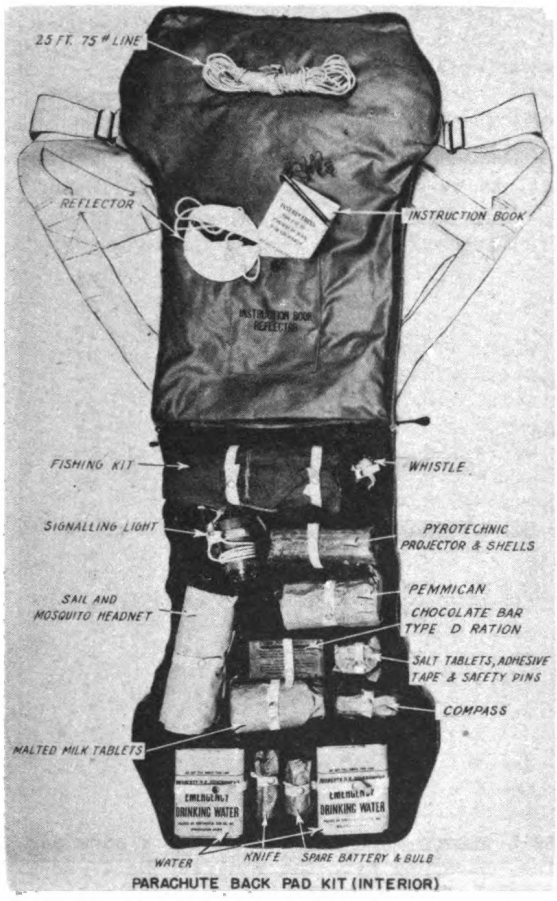
as three pockets in which is stowed emergency equipment. The complete equipment for
omes in two cases fastened together by a lanyard. One case contains the raft with
n the pockets and the other contains emergency equipment which must be kept waterproof

e raft is available for immediate distribution. When ordering, specify: (a) quantity
) type: Droppable, Standard or Automatic, (c) stock number, (d) specification number,
lication number. Mark VII Life Rafts are available to the activities as listed below.

	Stock No.	Specification Number	Class. No.
atic, Droppable, MARK VII	R83-R-15570	M-3Q	83
the following accessories:			
ishment purposes individual items of the kit can be replaced by using the following pecification numbers.)			
ng Case	R83-C-8550	M-3Q	83
er Valve Assembly	R83-C-94676	M-3Q	83
ner only (for stowing erproof equipment)	R83-C-66775	M-3Q	83
3 - 6 ft.	R83-0-4020	M-162	83
Hole Plugs, 5 per raft	R83-P-408500	M-3Q	83
Kit in repair pocket	R83-K-710150	M-3Q	83
it contains:			
Patching Material			
Tire Patches			
Rubber Cement			
Metal Roughing Tool			
Pliers			
Scissors			
ply Pocket:			
and Pump	R83-P-408500	AN-P-48	11
ails, 2 per raft	R83-C-76950	M-551	83
ishing Kit	R37-K-300	M-552	37
atch Box Compass	R37-C-2500	M-554	37
moke Grenade Holding Clamp	R83-C-44600	M-3Q	83
ignaling Reflector	R83-R-205000	M-3Q	83
nife	R41-K-365	M-3Q	41
histle	R42-W-24000	M-3Q	42
ine 25' - 75# test	21-R-150	M-3Q	21

(Continued on next page)

ORIGINAL BACK PAD KIT (KIDNEY SHAPED), CONTRACT NO. N288s-10807 (INTERIOR)



PARACHUTE BACK PAD KIT (INTERIOR)

STANDARD BACK PAD KIT, SPEC. M-592 (INTERIOR)

A Fishing Kit
B Projector Kit
C & D Tablet Rations
E Oil
F Pins, Tape and Salt Tablets
G Sunburn Ointment
H 25' of 75# Test Line
I Tablet Rations
J Jackknife
K Compass Ma
L, M & N Firs
O Gloves
P Poncho
Q Mosquito He
R Machete
S Instructio
and Signal
T Magnifying

ORIGINAL BACK PAD KIT (KIDNEY SHAPED), CONTRACT NO. N288s-10807 (FRONT VIEW)

PARACHUTE BACK PAD KIT (FRONT VIEW)

STANDARD BACK PAD KIT, SPEC. M-592 (FRONT VIEW)

RD BACK PAD KIT

ication No. M-592, Drawing No. 8802. This kit weighs 13 pounds and is approximately 13" 20" long and 3" thick.

odified kit on preceding page.)

	Stock No.	Specification Number	Class. No.
rd Back Pad Kit, Complete	R83-K-520100	M-592	83

tains the following accessories:
eplenishment purposes individual items of the kit can be replaced by using the following and specification numbers.)

ergency Drinking Water, 12-oz. rectangular can	R51-W-135	AN-W-5b	51
ife Raft Tablet Rations	R56-R-6300	M-539b	56
shing Kit	R37-K-300	AN-L-2	37
mpass and Match Container	R37-C-2500	AN-C-101	37
adnet and Fish Seine	R83-H-200000	M-565	27
5' of 75# Test Line	21-R-150	M-592	21
rotechnics	R83-K-710309	M-592	83
rst Aid Kit	R57-K-8525	M&S57-K0366	57
ckknife	R41-K-365	M-575	41
istle	R42-W-24000	M-592	42
n-folding Machete	C.F.E.	BuAer Drawing 8662	C.F.E.
gnaling Mirror	"	M-580	"
hesive Tape	"	C.F.E.	"
lt Tablets	"	"	"
arpening Stone	"	"	"
ncho	"	NAF-P-61	"
tton Gloves	"	NAV-73-G-3	"
nburn Ointment	"	C.F.E.	"
gnifying Glass	"	"	"
rrosive Preventative	"	"	"

ility

Requisitioning activities will use stock No. R83-K-520100 when requisitioning a back pad. , supply officers will deliver either the Original Back Pad Kit, the Modified Back Pad Kit, Standard Back Pad Kit M-592 under this stock number. If all these kits are available, unherwise specified by the requisitioning activity, the Original Back Pad Kit and the Modiack Pad Kit will be exhausted before the Standard Back pad Kits are issued.

l Back Pad Kits were allocated under contract number N288s-10870, quantity 20,000, for dision as follows:

Priority	Destination	Quantity
1st	N.A.S., Pearl Harbor, T.H.	1,000
2nd	N.A.S., Alameda, California	1,000
3rd	N.A.S., San Diego, California	1,000
4th	N.A.S., Seattle, Washington	500
5th	N.A.S., Quonset Point, Rhode Island	500
6th	N.A.S., Norfolk, Virginia	500
7th	N.A.S., Pearl Harbor, T.H.	2,000
8th	N.A.S., Alameda, California	2,000
9th	N.A.S., San Diego, California	2,000
10th	N.A.S., Seattle, Washington	1,500
11th	N.A.S., Quonset Point, Rhode Island	500
12th	N.A.S., Norfolk, Virginia	500
13th	N.A.S., Coco Solo, Canal Zone	200
14th	N.A.S., Guantanamo Bay, Cuba	200
15th	N.A.S., Trinidad, B.W.I.	200
16th	N.A.S., San Juan, P.R.	200

(Continued on next page)

RICTED

17th	N.A.S., Corpus Christi, Texas	200
18th	N.A.S., Jacksonville, Florida	200
19th	M.C.A.S., Cherry Point, N. Carolina	200
20th	N.A.S., Pensacola, Florida	200
21st	N.A.S., Miami, Florida	200
22nd	N.A.F., Philadelphia, Pennsylvania	200
23rd	A.S.A., Oakland, California	3,000
24th	A.S.A., Norfolk, Virginia	2,000

The Modified Back Pad Kits, which differ only in thickness from the Original Back Pad Kits allocated under contract number N288s-17021, quantity 10,000, for distribution as follows:

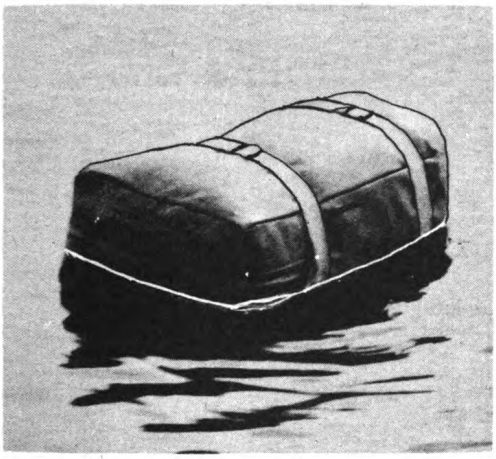
Priority	Destination	Quantity
1st	S.O., N.A.S., Pearl Harbor, T.H.	500
2nd	S.O., N.A.S., Alameda, California	500
3rd	S.O., N.A.S., San Diego, California	500
4th	S.O.. N.A.S., Seattle, Washington	250
5th	S.O., N.A.S., Quonset Point, R.I.	250
6th	S.O., N.A.S., Norfolk, Virginia	250
7th	S.O., N.A.S., Pearl Harbor, T.H.	1,000
8th	S.O., N.A.S., Alameda, California	1,000
9th	S.O., N.A.S., San Diego, California	1,000
10th	S.O., N.A.S., Seattle, Washington	750
11th	S.O., N.A.S., Quonset Point, R.I.	250
12th	S.O., N.A.S., Norfolk, Virginia	250
13th	S.O., N.A.S., Coco Solo, Canal Zone	100
14th	S.O., N.A.S., Guantanamo Bay, Cuba	100
15th	S.O., N.A.S., Trinidad, B.W.I.	100
16th	S.O., N.A.S., San Juan, Puerto Rico	100
17th	S.O., N.A.S., Corpus Christi, Texas	100
18th	S.O., N.A.S., Jacksonville, Florida	100
19th	S.O., M.C.A.S., Cherry Point, N. Car.	100
20th	S.O., N.A.S., Pensacola, Florida	100
21st	S.O., N.A.S., Miami, Florida	100
22nd	S.O., N.A.F., NYd., Philadelphia, Pa.	100
23rd	S.O.I.C., A.S.A., N.S.D., Oakland, Cal.	1,500
24th	O.I.C., A.S.A., N.O.B., Norfolk, Va.	1,000

Standard Back Pad Kits under specification M-592 were ordered under contract number N288s-2 quantity 15,000, for delivery to Oakland Annex and under contract number N288s-23690, quant 30,000, for distribution as follows:

Norfolk Annex	10,000
Oakland Annex	15,000
Naval Aviation Supply Depot, Philadelphia	5,000

A Flashlight
B Jackknife
C Fishing Kit
D Rations
E, & F 25' Line
G Compass Match Box
H Lubricant
J Whistle
I, K, L, & M Rations
N Tomato Juice
O Chicken Broth
P Drinking Water
Q Dye, Sea Marker
R Rations
S Projector Kit
T First Aid Kit
U Dye, Sea Marker
V Emergency Signaling Mirror
W Instruction Booklet

AIRCRAFT SHIPWRECK KIT, SPEC. M-594a



AIRCRAFT SHIPWRECK KIT AFLOAT

Stock No.	R83-K-710400
Specification No.	M-594 and M-594a (See schedule below)
Shipping Data	Shipped in 1 carton complete with accessories
Color	Orange-yellow
Weight	M-594, 55 lbs., M-594a, 55 lbs.
Dimensions	33" long, 15" wide, 11½" high

Aircraft Shipwreck Kits are intended to be dropped survivors on rafts or in the water. They are desi to provide emergency equipment to distressed perso until rescue can be made.

When ordering, specify: (a) quantity, (b) stock n (c) specification number, (d) classification numbe Aircraft Shipwreck Kits are available to the activ as listed below.

M-594

Date of original contract No. NOa(s)-923, June 5, 1943, for 1,000 Aircraft Shipwreck Kits, 55 lbs. each.

Item	Stock No.	Specification Number	Class.
Aircraft Shipwreck Kit, complete	R83-K-710400	M-594	83

It contains the following accessories:
(For replenishment purposes individual items of the kit can be replaced by using the follow stock and specification numbers.)

Emergency Drinking Water, 8 cans	R51-W-135	AN-W-5	51
Fishing Kit	R37-K-300	AN-K-2	37
Scout Knife	R41-K-365	M-575	41
First Aid Kit	R57-K-8525	M&S57-K-0366(INT)	57
Drinking Cup (graduated)	R83-C-81525	M-594	83
Pyrotechnic Projector Kit	R83-K-710309	M-594	83
Dye, Sea Marker (2 cans)	R37-P-25	M-566	37
Woolen Blankets, 2 per kit	27-B-40	Nav 27B7	27
Compass Match Box	R37-C-2500	AN-C-101	37
50' 75# cotton cord	21-R-150	M-594	21
Whistle	R42-W-24000	M-594	42
Flashlight, waterproof	17-F-13550	M-594	17
Sunburn Ointment	C.F.E.	C.F.E.	C.F.
Reflector Signaling Mirror	"	"	"
Safety Pins	"	"	"
Malted Milk Tablets (2 bot.)	R56-R-6125	M-539	56
Chicken Broth, 2 12-oz. cans	C.F.E.	C.F.E.	C.F.
Tomato Juice, 2 12-oz. cans	"	"	"
Chewing Gum, 2 packages	"	"	"
Lemon Drops, "Charms"	"	"	"
Cigarettes, 40 with matches	"	"	"
Whiskey, 4 2-oz. bottles	"	"	"

Alcohol causes body dehydration, thus4 bottles of whiskey have been elimnated from the new type kits and 9 extra cans of water have been added.

M-594a

Date of original contract No. N2883-22029; 12 April, 1944, for 5,000 Aircraft Shipwreck Kit weight 55 lbs.

	Stock No.	Specification Number	Class. No.
?t Shipwreck Kit, complete	R83-K-710400	M-594a	83
:ains the following accessories:			
:plenishment purposes individual items of the kit can be replaced by using the following			
ınd specification numbers.)			
ıergency Drinking Water, 17 cans	R51-W-135	AN-W-5b	51
lshing Kit	R37-K-300	AN-K-2	37
ıife	R41-K-365	M-575	41
lrst Aid Kit	R57-K-8525	M&S 57-K-1(INT)	57
'inking Cup	R83-C-81525	M-594a	83
'ojector Kit	R83-K-71309	M-594a	83
:a Marker	R37-P-25	M-566	83
.ankets, 2 per kit	27-B-40	Nav 27B7	27
ımpass Match Box	R37-C-2500	AN-C-101	37
ıtions	R56-R-6300	M-539b	56
lne, 25' of 75# test	21-R-150	M-594a	21
ıistle	R42-W-24000	M-594a	42
.ashlight, waterproof	17-F-13550	M-594a	17
.ashlight Batteries	17-B-7210	M-594a	17
ınburn Ointment	C.F.E.	C.F.E.	C.F.E.
ignaling Mirror	"	580-A	"
lhesive Tape	"	C.F.E.	"
.fety Pins	"	"	"
ıicken Broth	"	"	"
ımato Juice	"	"	"

:al Orders covering Shipwreck Kit (None).

ıility

Requisitioning Activities will use stock No. R83-K-710400 when requisitioning a Shipwreck lowever, supply officers will deliver either the M-594 or the M-594a under this stock number. ı are available, unless otherwise specified by the requisitioning activity, the M-594 kits : exhausted before the M-594a kits are issued.

hipwreck Kits have been delivered and are available to all activities in limited quantities. 'y was complete by the manufacturer as of August 1, 1943. Distribution was made according following schedule.

Activity	Quantity
N.A.S., Pearl Harbor, T.H.	100
A.S.D., Noumea, New Caledonia	150
N.A.S., San Diego, California	100
N.A.S., Norfolk, Virginia	100
N.A.S., Alameda, California	100
N.A.S., Seattle, Washington	100
N.A.S., Quonset Point, R.I.	100
N.A.S., Coco Solo, Canal Zone	12
N.A.S., Guantanamo Bay, Cuba	12
N.A.S., Trinidad, B.W.I.	12
N.A.S., San Juan, P.R.	12
N.A.S., Jacksonville, Florida	12
N.A.S., Miami, Florida	12
N.A.S., Corpus Christi, Texas	12
N.A.S., Pensacola, Florida	12
M.C.A.S., Cherry Point, N. Car.	12
M.C.A.S., Saint Thomas, V.I.	
N.A.S.D., Philadelphia, Penna.	43
A.S.A., Norfolk, Virginia	43
A.S.A., Oakland, California	43

:TED

R16-T-9169

RADIO TRANSMITTER ASSEMBLY SCR-578 A
OR SCR-578 B ("GIBSON GIRL")

Radio set SCR-578-A or SCR-578-B, known as the "Gibson Girl," is a simple, rugged, and hand emergency transmitting system which has been designed to be operated from a life raft. No ing equipment is incorporated in the construction of this set. The "Gibson Girl" is constr to provide automatic transmission of predetermined signals so that any operator, no matter he has been trained or not, can send distress signals which will permit a bearing to be tak his location or position determined. The unit can be adjusted to transmit SOS signals, a c ous signal, or it can be keyed manually. An attachment has been fitted on the transmitter enables a signal light to be attached for night usage. This unit is held between the knees operator and the power needed for transmitting is generated by turning a crank which is att to the top part of the set. A box kite or a balloon is provided as a means of raising the The transmitter operates on the international distress frequency of 500 KC, and is packed i terproof container which makes the entire unit buoyant when it is dropped into the water by chute. This "Gibson Girl" has a limited range from 30 to 300 miles at sea, depending upon mospheric conditions.

The main difference between the "A" and "B" sets consists mainly in the packaging and the containers used. Each set complete will contain the following:

1 radio transmitter
1 inflation tube
1 parachute
1 hand crank
Antenna wire
1 accessory bag containing the following:
    1 kite
    1 signal light: either (a) flat lens or
                        (b) round lens
    1 extra roll of antenna wire
    1 Instruction Booklet
    2 balloons
    2 hydrogen generators

The weight of the SCR-578-A is 34 lbs. to 38 lbs., depending upon the hydrogen generator us weight of the SCR-578-B is from 38 lbs. to 42 lbs., depending upon the hydrogen generator u

Radio set AN/CRT-3, a modification of SCR-578-A or SCR-578-B, is now under development. It been designed to transmit on the frequencies of 500 KC and 8280 KC. Transmission will be ically shifted every forty seconds from one frequency to the other. The higher frequency w greatly increase the range of the set. On tests using the 8280 KC frequency, satisfactory have been taken up to 1600 miles. This set should become available to the activities after 1, 1945.

RESTRICTE

ent under contract is to be delivered before October, 1944. Shipments are being made to th
ing:

Activity	Quantity
A.S.A., Oakland, California	3,000
N.A.S.D., Philadelphia, Penna.	2,000

nts are being made by the contractor to the above, but are to be redistributed to the fol-
activities:

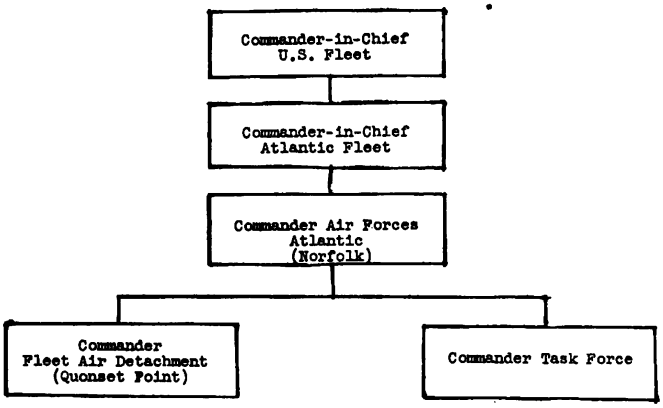
N.A.S., Alameda, California
M.C.A.S., Cherry Point, N. C.
N.A.S., Corpus Christi, Texas
N.A.S., Jacksonville, Florida
N.A.S., Miami, Florida
N.A.S.D., Philadelphia, Penna.
A.S.A., Norfolk, Virginia
N.A.S., Norfolk, Virginia
A.S.A., Oakland, California
N.A.S., Pensacola, Florida
N.A.F., Philadelphia, Penna.
M.C.A.S., Quantico, Virginia
N.A.S., San Diego, California
N.A.S., Seattle, Washington
N.A.S., Bermuda
N.A.S., Coco Solo, Canal Zone
N.A.S., Guantanamo Bay, Cuba
N.A.S., Pearl Harbor, T.H.
N.A.S., San Juan, P.R.
N.A.S., Trinidad, B.W.I.

N.A.S.
Pensacola
Fla.

tlanta, Ga.
(LFA)-Houma,
ew Orleans,
-Biloxi, Mis

TED

ATLANTIC FLEET ORGANIZATION
(Tentative Plan)



Functions similar to Aircraft Material Office at Oakland.

N.A.S. Pensacola Fla.	N.A.S. Miami Fla.	N.A.S. Jacksonville Fla.	N.A.S. Norfolk Va.	Supply Department N.A.S.D. Phila., Penna.	N.A.S. Quonset Point R.I.
tlanta, Ga. (LTA)-Houme, La. ew Orleans, La. Biloxi, Miss.	NAS-Ft. Lauderdal, Fla NAS-Great Exuma, Bahamas. NAS-(LTA)-Richmond, Fla. CGAS-Miami, Fla. NAS-Key West, Fla.	NAS-Banana River, Fla. NAS-Daytona Beach,Fla. NAS-Deland, Fla. NAS-(LTA)-Glynco, Ga. NAS-Lake City, Fla. NAS-Melbourne, Fla. NAS-St. Simons Is, Ga. NAS-Sanford, Fla. NAS-Vere Beach, Fla. CGAS-St. Petersburg, Fla.	NAS-Beaufort, S. C. NAS-Bermuda, B.W.I. NAS-Charleston, S. C. NAS-(LTA)-Weeksville, N. C. MCAS-Edenton, N. C. MCAS-Parris Is, S. C. CGAS-Elizabeth City, N. C. Fleet units in Middle and South Atlantic. Emergency requests from Major Supply Points in Atlantic-Panama-Caribbean Area.	NAF-Philadelphia, Pa. NAS-Anacostia, D. C. NAS-Atlantic City, N.J. NAS-Cape May, N. J. NAS-Wildwood, N. J. NAS-Traverse City,Mich. NAS-Hutchinson, Kan. NAS-Glenview, Ill. NAS-Grosse Ile, Mich. NAS(LTA)-Lakehurst,N.J. NAS-Memphis, Tenn. NAS-New York, N. Y. NAS-Olathe, Kan. NAS-Ottumwa, Iowa NAS-Patuxent River, Md. NAS-Bunker Hill, Ind. NAS-Willow Grove, Pa. NAS-St. Louis, Mo. NPG-Dahlgren, Va. NTS-Memphis, Tenn. ADU-Columbus, Ohio ADU-Trenton, N. J. CGAS-New York, N. Y.	NAS-Argentia, Nfld. NAS-Brunswick, Md. NAS-(LTA)-South Weymouth, Mass. NAS-Squantum, Mass. CGAS—Salem, Mass. Fleet units in North Atlant'c.

20 August, 1943

BOARD FOR AIR SEA RESCUE
COMMITTEES FOR JOINT STUDIES

(1) Committee to review and study the preparation of energency and survival publications with a view to improving coordination between the various services and eliminating duplication.

Coast Guard:	(Vacancy), Chairman
Army:	(Vacancy)
Navy:	Lt. Norville W. White

(2) Committee to study the adequacy of air sea rescue facilities including command, organization, installations, aircraft and surface craft.

Coast Guard:	Commander A. E. Harned, Chairman
Army:	Major T. J. Borgman
Navy:	Lt. C. W. Brown

(3) Committee to study the communications facilities and requirements for air sea rescue including communications facilities, and emergency and rescue communications procedures.

Coast Guard:	Captain E. M. Webster, Chairman
Army:	Captain J. M. Sherman
Navy:	Commander C. L. Harding, USCG

(4) Committee to study special aircraft equipment for rescue and survival including airborne lifeboat, Lindholme dinghy, droppable equipment, etc.

Coast Guard:	Lt. Comdr. J. D. McCubbin, Chairman
Army:	Captain K. O. Bennington
Navy:	Lt. (jg) R. J. Willingham, III

(5) Committee to study primary lifesaving equipment on heavily loaded transports.

Coast Guard:	Commander R. A. Smyth, Chairman
Army:	Major P. P. Fenwick
Navy:	Lt. Comdr. J. L. Caillouet, Jr.

(6) Comittee to study the medical and physiological aspects of air sea rescue.

Navy:	Lt. Comdr. C. F. Gell, Chairman
	Captain John H. Korb
Army:	(Vacancy)
	Major Frederick Fink, ASF
U.S.P.H.S.:	Senior Surgeon P. A. Neal
R.A.F.:	Wing Commander P.O. Lee

(7) Committee to study ditching procedures.

Coast Guard:	Comdr. A. E. Harned, Acting Chairman
Army:	Comdr. Harry R. Horney
Army:	Capt. K. O. Bennington, AAF
RAF	Wing Commander R. Bicknell

B

RESTRICTED

AIR SEA RESCUE AGENCY
R. R. Waesche, Vice Admiral
U. S. Coast Guard

BOARD FOR AIR SEA RESCUE

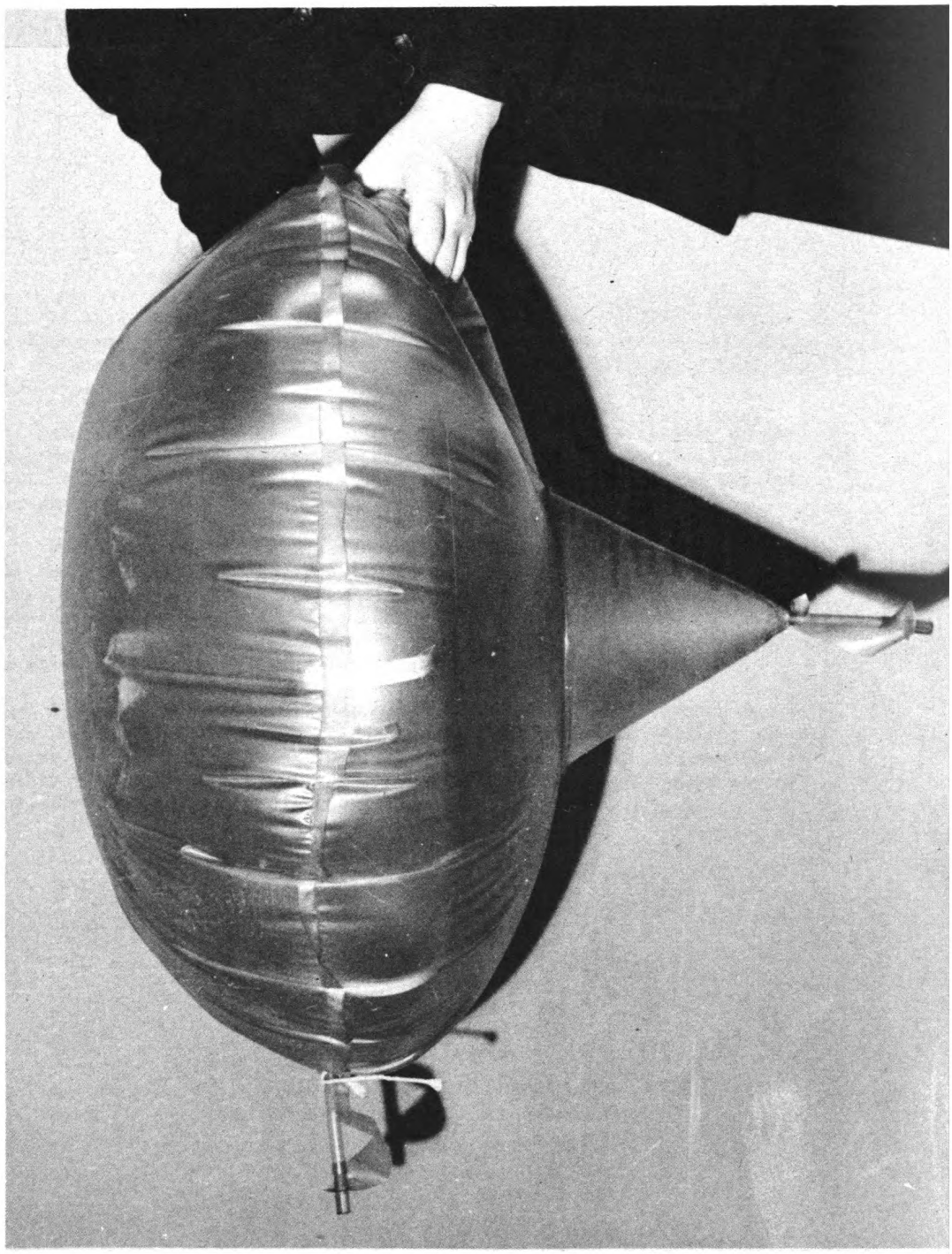
C. V. Whitney, Colonel	U. S. Army Air Forces.
C. B. Whitehead, Lieutenant Colonel	U. S. Army Air Forces.
W. J. Renn, Lieutenant Colonel	U. S. Army Service Forces.
C. D. Emory, Captain	U. S. Navy.
Paul Foley, Jr., Commander	U. S. Navy.

CONTENTS

* * * * *

Communications To Air Sea Rescue Bulletin
should be addressed:

AIR SEA RESCUE BULLETIN
AIR SEA RESCUE AGENCY
1300 E STREET N.W.
ASHINGTON, D. C.



TELKES SUN STILL

AIR SEA RESCUE BULLETIN

It is worthy of note that we are continuing to work with emphasis on development of rescue equipment, methods, techniques, and procedures, even in the midst of a war which is inflicting upon the world the greatest destruction of life and property in all history.

At the request of the Joint Chiefs of Staff, the Secretary of the Navy has established the Air Sea Rescue Agency to conduct joint studies and collect and disseminate information on all rescue devices, and maintain liaison on such subjects with the United Nations.

The scope of this work essentially is broad because we are engaged in war operations extending virtually to every corner of the earth's surface. Under the stress of these circumstances, much rescue equipment, and many methods, techniques, and procedures previously developed are obsolete, or of limited usefulness; and some problems are new. Progress in rescue work is vital in war, and will be important in peace.

In order that all concerned may be informed on developments and progress in the field of rescue, the Agency will publish monthly the Air Sea Rescue Bulletin. Pertinent information developed by the Air Sea Rescue Agency Staff and assembled from other sources will be published in the Bulletin for restricted distribution.

R. R. WAESCHE
Commandant, U. S. Coast Guard
(Head of Air Sea Rescue Agency)

AIR SEA RESCUE AGENCY ORGANIZATION

The Air Sea Rescue Agency has been established by the Secretary of the Navy in accordance with the request of the Joint Chiefs of Staff.

Under its directive, the Agency is headed by the Commandant of the Coast Guard, assisted by a board representing Army Air Forces, Army Service Forces, and the Navy; and officers from the several services have been assigned to duty on the Agency's staff.

Members of the board, officially known as the Board for Air Sea Rescue, are:

Colonel C. V. Whitney and Lt. Col. C. B. Whitehead from Army Air Forces.

Lt. Col. W. J. Renn from Army Service Forces.

Capt. C. D. Emory and Comdr. Paul Foley, Jr., from the Navy.

The Agency will conduct joint studies and assemble information, disseminate that information with appropriate recommendations for action to all interested agencies of the United States, and maintain liaison with agencies of other United Nations, on two phases of Air Sea Rescue. One of these phases embraces work with technical data concerning research, development, and design of air sea rescue equipment; the other involves methods, techniques, and procedures including the adequacy of facilities for Air Sea Rescue.

The Agency's joint studies are made by committees established by the Board when necessity is indicated. At present committees are considering emergency and survival publications, the adequacy of existing Air Sea Rescue facilities, a communications doctrine and recommendations on a plan for coordination of communications facilities in rescue operations, droppable rescue equipment including airborne boats, Lindholme dinghy, life rafts, etc., and primary life saving equipment on heavily loaded transports.

* * * * * * *

DRINKING WATER AT SEA

FOR AIRMAN AND SEAMAN

One of the many somewhat dreamlike projects to which war has lent cal impetus is the creation of means to make the sea yield drinka ter. No risk of shipwreck is more justly dreaded by mariners tha of water, and airmen now share the risk. In fact, the airman's chance of water failure is greater than that of the seaman.

Lifeboats and large rafts of ships can and do carry ten quarts of water per man. Occ ly water breakers burst a plug from force of an explosion. But barring such accidents men boat, without rain, have an adequate supply for 20 days. Chances of being rescued within weeks are good. For this reason regulators of marine equipment have not considered increa man-water ratio vitally urgent.

For airmen down at sea the story is different. Combat aircraft and their inflatable rafts must travel light, precluding a generous cargo of water casks. The average allowanc man currently is less than two pints, enough for two days only, according to medical autho The problem is to squeeze more water into available carrying space.

There is not yet recorded an effort to concentrate water into tablets. But some appa designed to solve the problem appears to stem from Rube Goldberg; for example, a gadget to and condense vapor of a man's breath. Three practical methods of producing drinking water have, however, emerged from experimental stages. They are:

(1) Removal of salts from sea water by addition of chemicals.

(2) Distillation of fresh from salt water by small fuel-burning stills.

(3) Distillation of fresh water by "Solar Stills," using sun alone.

DESALINATION BY CHEMICALS

Chemical desalination is not based upon a new principle. Patents ing to this method were taken out as early as ten years ago. Ext experiments have been conducted during recent years by both the P Company in the United States and the Water Pollution Research Board in England. Working i ently, both have produced chemical briquets which, when shaken in sea water, precipitate t Sea water thus treated is drinkable when filtered. The Water Pollution Research Board, wo with the RAF, and Permutit, collaborating with the U. S. Navy, have designed kits for use briquets.

The English WPRB kit is designed to occupy space of two present 14-ounce water cans i dinghy equipment. It weighs 4½ pounds and includes 18 briquets, or charges, enough to pro 180 ounces (about 11 pints) of water — approximately six times the capacity of the two c der contract, production of these kits may reach 7,000 monthly. They will be substituted ter rations in RAF multi-seater fighters, one kit to replace each two cans.

The Permutit-Navy kit occupies the same space as one 12-ounce can of water, weighs 2 and contains 6 briquets, enough to render 6 pints — approximately seven times the amount replaced can. Navy Bureau of Aeronautics has procured 160,000 of these kits, and expects begin substituting one kit for one of the two water cans allowed each man in Navy aircraft Air Force has directed that one-man rubber rafts are to contain one Permutit kit, and Roya dian Air Force now is considering possible adoption.

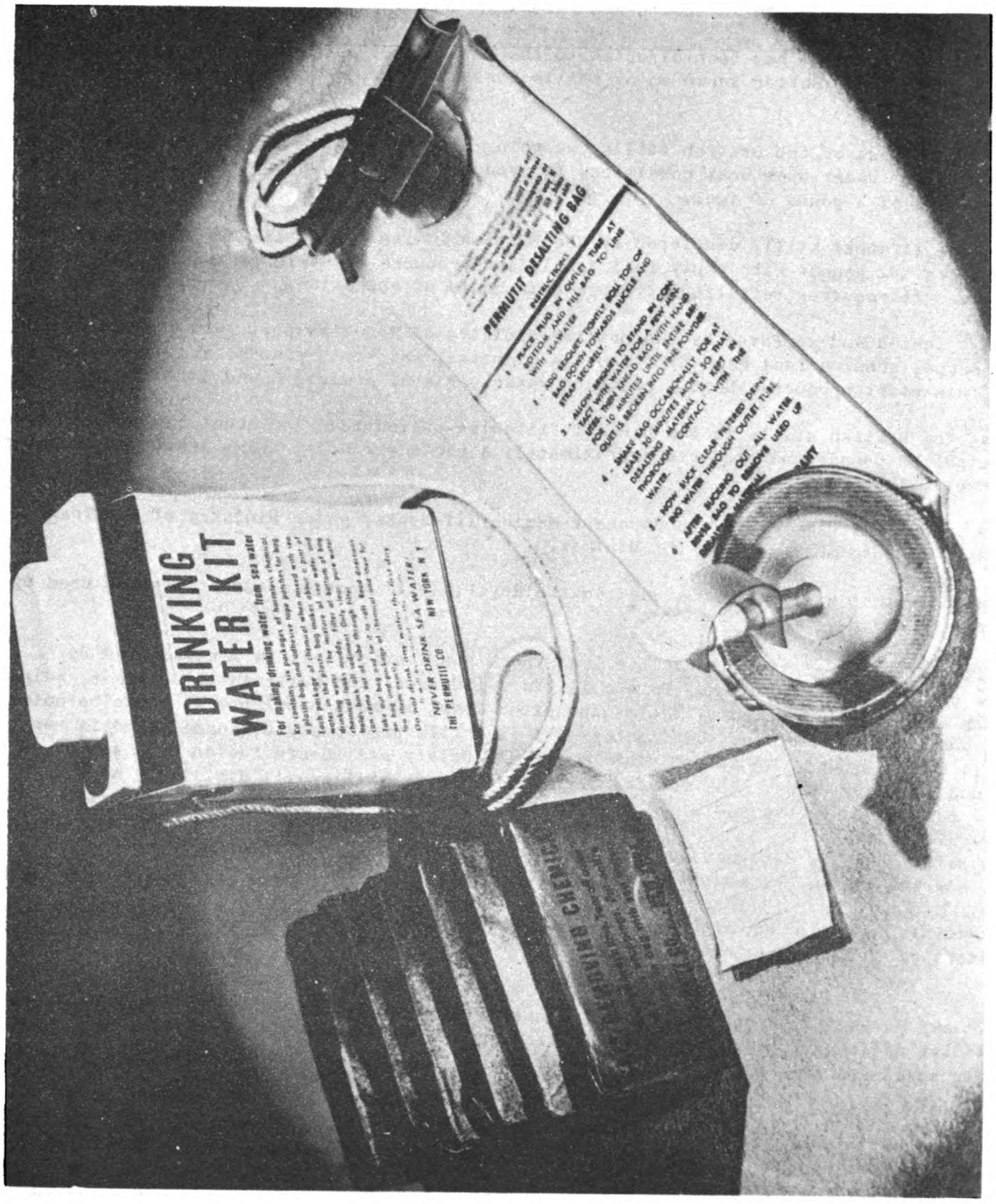
Merits of WPRB versus American Permutit equipment have not been fully evaluated. The Pollution Research Board made some tests of the Permutit kit in prefinal stages, and Permu Company tested WPRB equipment, but official comparative tests are yet to be performed. Re of such tests probably would indicate both processes render approximately the same amount able water per briquet volume, but that qualities of the water differ in a degree more aca than practical.

Of the two, the American Permutit kit is simpler in use, but in early tests a mildly pleasant flavor was believed to have resulted from treatment of the water in the vinylite 's said to be corrected. Both require about half-hour for production of a pint of water.

Pictures of these kits appear on pages 4 and 5.

British W.P.R. Drinking Water Equipment.

Packaged, the two cans contain 18 chemical briquets, filter papers, and pump. In use, contents are dumped into waterproof bag, sea water and briquet are shaken together in Purifier can, desalted water is pumped through filter into Drinking can.



American Permutit Drinking Water Kit.

Chemical packets and plastic bag are stowed in can. In use, sea water and briquet are mixed in bag by kneading and shaking, resultant fresh water is sucked from outlet tube, passing through filter in bottom.

BURNING STILLS

Fuel stills for distilling fresh from sea water are not new in principle either, many of them — notably Barnstead and Higgins — have been and are used by U. S. Armed Forces in the field. But development of small tills designed for use in lifeboats and rafts is recent.

ial British attention has been directed to the development and testing of this type of ng the past year. Better known among stills for this purpose are Goodfellow, Young, nd Dirshel.

oung is smallest of the British stills, weighing 35 pounds and measuring 16x10x10 inches. riquet coal. Under open boat conditions it produces about 5 U.S. pints* per hour, while four-fifths of a pound of fuel.

oodfellow lifeboat still, developed by the British Admiralty, is larger (22x9½x16½) but ghtly less (32 pounds with empty fuel tank), and produces about 10 pints of water per erosene. It requires refilling after each 12 hours of operation.

inimax, tested and approved by the British Ministry of War Transport last spring, is l in shape, about 3 feet high by 1 foot in diameter, weighs 42 pounds, and uses briquetted el. This still produces about 5 pints of water per hour and per pound of fuel.

est of the British stills is the Dirshel, likewise cylindrical and about the size of the It weighs 53 pounds and produces approximately 4 pints per hour, using less than one-half erosene.

ls are in general use in British Merchant Marine lifeboats, under Ministry of War Trans- lations. The one most used is the Minimax.

rts indicate that stills are not used in the Royal Navy. Some Minimax stills are used by is Merchant Marine.

ne United States, Safety Still is the best known small still. It is manufactured by el Co. of West Cheshire, Conn. This still is cylindrical and built in three sizes, weigh- ctively 17½, 8, and 4 pounds. The medium sized model is most popular. It is to be noted eighs one fourth as much as the lightest British still previously discussed, and is very ler (14 inches high by 7½ inches diameter). All Safety stills are fueled by a solid compound packed in tins. The manufacturer claims these stills will distill 11 to 12 water per pound of this fuel. In open boat tests they have done better, and worse.

large Safety unit is designed to produce 3.6 pints per hour, the intermediate 1.6, and one, now in process of modification, about 1 pint.

intermediate model, along with 49 cans (6 pounds) of Safety fuel, has for some time been equipment in the five-man rubber rafts of Transcontinental & Western Air (of Air Trans- and).

U. S. Navy Bureau of Aeronautics has purchased some 8-pound Safety stills (Navy Specifi- 362-1) for use in rafts on large patrol aircraft. They are not yet in service, but viously purchased some of the larger size for the same purpose, and is satisfied with iciency.**

bility and efficiency tests of the Safety still have had variable results. TWA and BuAer ort satisfactory performance. But last fall, Naval Medical Research Institute, in com- sea tests of various water-producing equipment (including sun stills and the Permutit nd several defects in this still; among them, unpleasant fuel fumes and sensitivity to waves.

ls are not standard lifeboat equipment on American merchant vessels, but Navy has pur- out 200 Safety stills for three large transport ships (transports are the only Navy hat use lifeboats in wartime).

cture of the Safety Still appears on Page 7.

---

ish imperial gallon (2 British quarts, 8 British pints) is equivalent of 10 U. S. pints.

Bureau of Ships has purchased about 500 of these stills for PT boats in the South Pacific

Safety Still in TWA Raft

(Official U. S. Navy Photograph)

The solar still is the youngest, or most experimental, of the three water-
S producing methods under discussion. The British, because of weather peculiar to their isles, have left that subject to the United States, and most of the work on solar stills goes to Massachusetts Institute of Technology and Chemical Co., Inc., of New York City.

allowhur "roll-up" sun still (Delano Model A Type) folds into a cylindrical cardboard 18 x 4⅝ inches in diameter. With the container, it weighs 2 pounds and 9 ounces. Un- is a square of spongy black cloth encased in a transparent plastic frame 15½x15½x7/8 ; may be set up anywhere in a raft or boat where it can catch the sun. The cloth is kept wet by sea water; the vapor created by the action of the sun on the wet cloth condenses er sides of the plastic and collects in the bottom of the frame, from which it is drawn e. One to two ounces of water per hour is average production. Army Air Forces have ,000 of these stills. Fragility is the principal objection to the roll-up still. It res considerable attention to operate.

ferent and newer type of sun still is the "cushion still." When inflated, this vinylite ats in the water alongside the raft, thus getting in no one's way. Sea water is poured e funnel into the outlet and is absorbed by the black sponge pad inside the evaporator. tube and then the outer casing are blown up orally or with life raft pump. The excess is drained out and the still is put overboard. The sun heats the water in the sponge oduces vapor which runs down through the outlet into the water bag. This type of still ittle attention.

ria Telkes of MIT has developed such a still, and the Gallowhur Company a similar model feeding wicks. Deflated, the Gallowhur model folds into a flexible bag 6½ x 3-3/8 inches, ole weighs only 13 ounces. In tests off Miami last February, the Telkes still produced ces of water per hour of sunshine, about the best so far for sun stills under test con- The bugs yet to be eradicated in cushion stills are: (1) fragility, and (2) unpleasant the water due probably to some factor in the vinylite. Sun stills are obviously useful nny seas, but this may not be called a defect. Their extreme lightness and compactness e them valuable as auxiliary equipment, and southern waters where they could be used are onnel is likely to remain adrift longest, and be thirstiest. It must not be forgotten vailability of water is a factor in mental as well as physical survival. A sun still the only method promising limitless supply of water. By that token it is the one offer- st sense of security.

RISON Any equipment designed to supply drinking water to men adrift at sea
TINGS must be judged by rating in the following tests: (1) Compared to space occupied by equipment and its weight. (2) Ruggedness of equipment - to the effects of wind and waves. (3) Ease of operation.

ie three more practical methods evolved during the last two years, chemical desalination st overall rating. It achieves a six to one ratio for Test 1, and excellent marks in d 3. The Naval Medical Research Institute test rated the Permutit kit by far the method ice.

stills make a good grade on Test 1, especially over a long period. But the bulk and even the smallest restricts their use to boats and larger rubber rafts. They are af- ersely by wind and waves, and their operation is most complicated of the three.

stills, while easily passing Test 3, have not yet made a passing grade on Test 2. Their Test 1 is potentially the highest of all, but only in tropical seas. They are notably compact, and although they cannot be used as an exclusive source of supply, their value ary equipment should not be underestimated.

OGRAPHY *An Appraisal of Some Devices for Obtaining Drinking Water from the Sea under Actual Conditions of Inflatable Life Rafts.* Research Project X-127, Two, Naval Medical Research Institute, National Naval Medical Center, Bethesda, Maryland. 11, 1943. Authors: Lt. W.V. Consolazio, USNR, and Lt. (jg) N. Pace, USNR. *Restricted.*

uction of Potable Water from Sea Water. A Survey of the Present Status of the Problem. prepared at Massachusetts Institute of Technology, Cambridge, Mass., for the general on of Division 11 of the National Defense Research Council (Project NS-168). Washington, ed July 7, 1943. By Abbott Byfield, Tech. Aide, Division 11, N.D.R.C.

* * * * *

RECENT DEVELOPMENTS IN SIGNALING MIRRORS

A DISCLOSURE BY R. S. HUNTER OF THE NATIONAL BUREAU OF STANDARDS IS QUOTED:

"Signal mirrors are small compact inexpensive which will give bright signals of reflected s visible for many miles. They have been devel during the present war chiefly for inclusion rescue equipment of life rafts and lifeboats. The 4-inch square mirror used by the Briti made of polished stainless steel and has tied to it a small white key. This is held in f the mirror to show by light reflected from it when the signal is aimed in the line of sig device most widely purchased by the American services is a tempered-glass mirror which re on both sides and has a cross-shaped viewing hole in the center. Signals from this mirro aimed by keeping the target in view through the hole while the image of the cross-shaped sunlight on some surface behind the mirror is observed in the rear of the mirror and brou coincidence with the hole by tipping the mirror. This 4 x 5 inch signaling mirror was de jointly by the National Bureau of Standards and the General Electric Company between Octo and March, 1943.

"In tests recently conducted by the National Bureau of Standards both the British fo and the American rearsight types of signaling mirrors were found hard to use from craft r in rough water. Signalers working from life rafts in open water found it especially diff keep an airplane in view through the small mirror peep holes as they performed the comple tasks necessary to direct mirror signals to it. A new type of signaling mirror proposed Charles H. Learned of Carmel, California, in a disclosure submitted to the National Inven Council. was used in the same tests and found to be much superior for signaling. This su is attributed to (1) the large window rather than restricted peep hole through which the target is viewed, and (2) the positive indication of the direction of signaling which is a bright red spot in the field of view.

REFLECTOR BUTTON ON LEARNED MIRROR

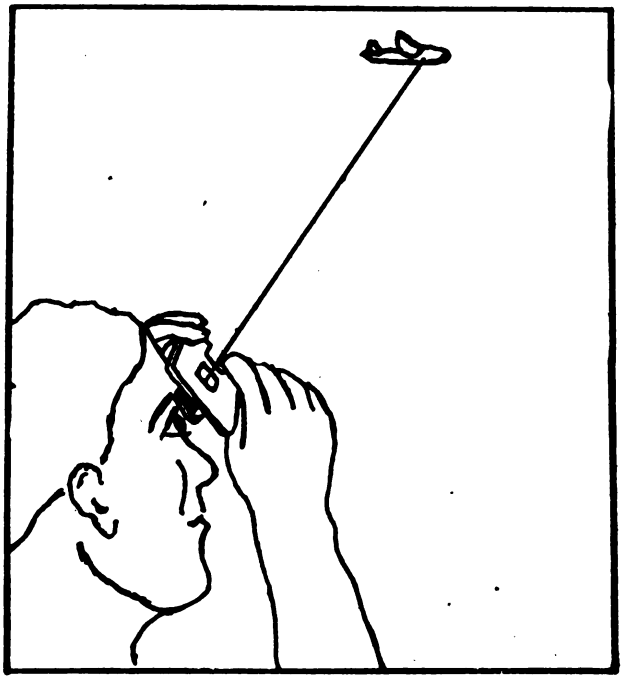
"The Learned signaling mirror makes use of a reflector butto the type which returns incident light toward the source from which it comes and is widely used on vehicles and traffic ba riers to make them more visible to night traffic. To make a Learned mirror, a window abo inch square is left near the center of the mirrorized coating of a small glass or clear p mirror. Inclined behind this clear window and attached at one side is a small retrodirec reflector button about the same size as the window.

"To signal with the Learned mirror, it is held so that sunlight passes through the c window and strikes the button. The signaler brings his eye to the rear of the mirror so can see under the inclined face of the button through the clear window. He sees a bright to show him the direction in which the mirror signal is being sent. He can put this sign ever he wants by simply twisting the mirror and directing the spot at the signaling targe

"The red spot is due to the red reflector button and to the surface of the clear win button reverses the direction of the beam of sunlight and colors it red. The surface of window, which is identical with the mirror surface, reflects part of this red beam toward of the observer. The direction of this reflection to the rear is exactly opposite to the tion of reflection by the main mirror and therefore the spot appears to be in the directi which the mirror signal is sent. A fortunate feature of this device is the fact that the appears to be distant rather than close; therefore the eye can be held immediately behind dow where it has a wide angle of view.

"The National Bureau of Standards has proposed several designs for production of the type of signaling mirror in both plastic and glass. Experiments are being conducted with designed to give colored instead of white signals. One manufacturer has proposed that th device be made an aid to both day and night rescue by the addition of a large retrodirect reflector to the rear of the mirror. Such a reflector is visible at night for great dist a rescue worker with a searchlight."

THE LEARNED MIRROR



TO SIGNAL WITH THIS MIRROR AIM RED SPOT AT TARGET

TO FIND RED SPOT, PROCEED AS FOLLOWS:

1. SWING FLAP BACK TO STOP

2. GRASP MIRROR BY LEGS & HOLD AGAINST FOREHEAD

3. TURN SO LEGS ARE NEAREST TARGET, OPPOSITE END IS NEAREST SUN, & MIRROR FACES HALF WAY BETWEEN

4. RED SPOT SHOULD THEN APPEAR IN THE SQUARE WINDOW

5. TWIST MIRROR TO PUT IT ON THE TARGET

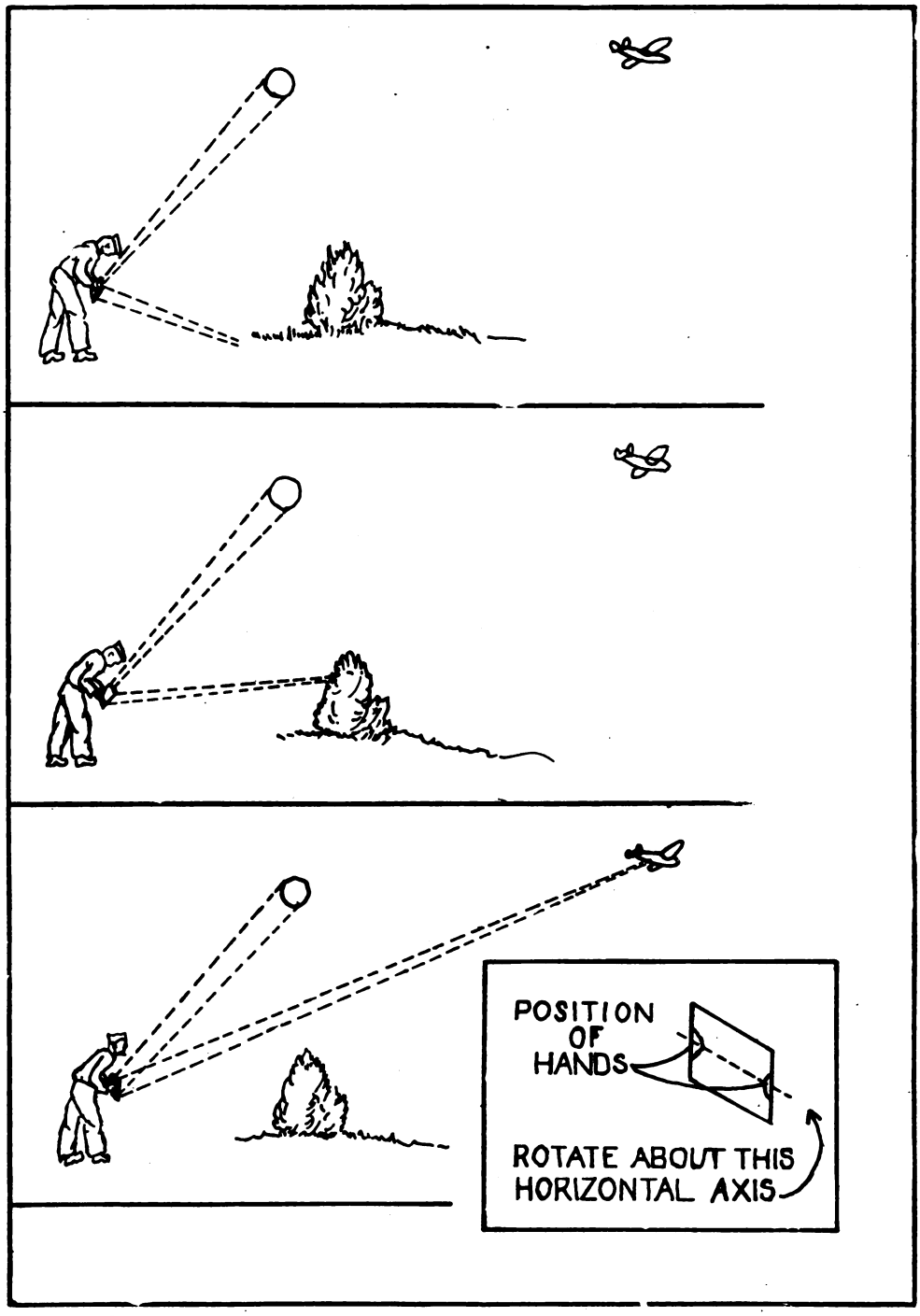
<u>IMPORTANT</u>: PRACTICE SIGNALING IN ALL DIRECTIONS

NATIONAL BUREAU OF STANDARDS 3 - '44

TWICHELL MIRROR AIMING METHOD

NEW AIMING METHOD, BOAT OR RAFT TEST IS CONTEMPLATED

There has also recently been received information on a new met of aiming a plane mirror. This method has been used successfu by Mr. W. D. Twichell in surveying work in Texas. Some prelim tests have been conducted by the Army, but no detailed reports been received. Preliminary tests here indicate that the method is quite efficient when use ashore. It is contemplated that tests from a boat or raft at sea will be made very shortly The principle of the method of aiming is quite simple, the flash being made to move in a li approximately perpendicular to the horizon and toward the target. If there is some object between the observer and the target on which the flash can be seen, the method works quite Continuous aiming, of course, cannot be attained by this method.



SURVIVOR ACCOUNTS

section of the Air Sea Rescue Bulletin *will publish narratives and comments by or about ing surface or aircraft disasters. Discomforts, desires, and ingenuities of men forced ship or aircraft at sea are valuable guides to continued improvement in rescue tech- equipment.*

* * * * *

IN MANNING
ETT'S ACCOUNT
RELATED COMMENT

Seaman Manning Clagett's ship was sunk during enemy action in the Arabian Sea early this year. All 68 of the crew on this small merchant vessel were rescued after four days. Their two lifeboats and three rafts were lashed together, and with the aid of charts and party in boats attempted to navigate. Nineteen men were in Clagett's boat. Its motor function. Very pistols, smoke bombs, and rockets were not successful in attracting atten- a coastal patrol plane which was sighted on the third day. Finally on the fourth day is made with a flying boat by using the portable radio. Seaman Clagett praised the radio, ked even after an accidental bath in the sea, as well as its automatic sending device not require a skilled operator to handle.

blankets were not used for warmth but for protection from sun. The tarpaulin was unhandy not be used as a protective awning when the sails were rigged. He suggested a lighter anket or throw would have been more useful in the Arabian Sea.

quipment

equipment was used principally for catching minnows and sharks. Minnows were eaten tructions advise against eating raw shark, but a ship's cook was aboard, so a stove was d from a bucket, a tin, and fishing tackle. Fire was started with paper wrapping, and was cooked in storm oil from the lifeboat equipment. SUGGESTION: A primus or sterno cooking birds or fish.

ons

rations consisted of malted milk tablets, chocolate, crackers (similar to graham crackers), pemmican (with raisins). Seaman Clagett did not object to sweetness of this particular The chocolate was best in his opinion but had a tendency to increase thirst. Pemmican was and because of this was saved until the last. Clagett said when help was enroute, some n ate too much of this and became ill as a result.

ions

e was a total of 310 quarts of water for 19 people in the 31-man boat. This would have nonth at the rate of a pint per day for each man. The crew elected to make it last three onths by allowing but a quarter-pint per day per man, two ounces in the morning and two Usually they were thirsty, but considered the ration sufficient for survival. This was according to medical authorities who hold daily requirement to be a pint per day over ods. All hands had a double ration after making contact with the plane. Seaman Clagett did not really want all of it." The men kept their clothing wet with sea water to prevent on. SUGGESTION: A posted warning that water must not be too severely rationed.

le in Clagett's opinion is highly important. He believes that men could have survived for s on the food and water that were available, but nervous and mental strain meanwhile e been their undoing. Factors contributing to strain were: (1) Muscular discomfort. The not sleep comfortably on the broken surfaces of the boat, and could not sit comfortably at surfaces of the rafts. (2) Lack of diversion. A deck of playing cards would have helpful in passing time and as a result a deck was finally fashioned from bits of card- igarettes were greatly desired by all survivors. SUGGESTION: The inclusion of these two lifeboat equipment.

Summary

The experiences of Clagett and his companions were not too arduous by comparison with but indicate: (1) The crew's training in abandon-ship procedure was good. Boats and raft launched successfully and lashed together and as a result none were lost. (2) Their train survival procedure was inadequate in one respect in that they underestimated minimum daily requirement. (3) Equipment in boats and rafts for physical survival was satisfactory, alt the food ration needed relief from sweets. An emergency stove would have been very useful For daytime contact with aircraft, radio signals were more efficient than flash and smoke

* * * * *

LIFEBOAT LOG BOOK

The Coast Guard has recently initiated the distribution of a log book placed in lifeboats and rafts of merchant vessels for the use of survi

Entitled *Log Book for Use in Lifeboats and Life Rafts*, this pamphlet has sixty pages space, with appropriate columns to record time, weather, position, and general remarks eac also data concerning the persons in the boat and the loss of their ship. At the back of t which is indexed, are twenty-one pages of advice on medical aid, protection from exposure, rations and ways to obtain more, habits of eating, sleeping, maintenance of discipline, et section includes a valuable article of instruction in navigation in emergencies, with tabl pared by Dr. Bart J. Bok of Harvard Astronomical Laboratory.

The purpose of the log is made clear in the foreword by Vice Admiral R. R. Waesche, U from which the following is quoted:

"... has been most difficult to obtain detailed information on events occurring during ment [of ship] and later while in boats or rafts, since memory is short and survivors ofte recall the facts which would be most valuable. It is believed that ... much useful data [obtained by recording events, as they occur, in this log book. In it also may be entered and suggestions for better means of abandoning ship and for improving lifesaving apparatus information will be utilized for the benefit of other seamen who may be forced to take to and life rafts in the future."

Survivors, when rescued, are asked to turn their log book over to the first Coast Gua fiver or office available, or to the American Consul of a foreign country, who will forwar the Coast Guard.

The log book is printed on waterproof paper and a punch hole has been provided for th ment of an indelible pencil. It is recommended that the book be kept in a metal chart con or placed in one of the lifeboat's provision containers.

* * * * *

HEALTH AND MEDICAL

OIL REMOVAL FROM SKIN, R.I. RESEARCH PROJECT X-195, FEBRUARY 7, 1944.

The Naval Medical Research Institute has completed investigation of detergents for removal of fuel oils from the skin. Early in the war many burned and wounded men were rescued from sea areas covered with fuel oil. Complete
f the oil seemed urgent for several reasons, (1) to find wounds, (2) to prevent contami-
3) to allow healing, and (4) esthetic reasons.

scale search was initiated for detergents which painlessly and completely would remove
the time detergents sought were to be antiseptic in nature. Later it became apparent
the first and last reasons for removal need be considered important, since fuel oil
y does not interfere with healing and is not a substance favoring growth of bacteria.

he course of investigation it was learned that ordinary mineral oil is an inert, painless,
ient solvent for fuel oil.

ch for a detergent then concentrated on increasing the power of mineral oil to remove
Comparative study has been made of 44 detergent-oil mixtures with mineral and coconut
detergents were found to enhance slightly the ability of mineral and coconut oil to
el oil. They are known commercially as Aerosol OT and Atlas G7596T. Coconut oil is an
solvent for fuel oil only at temperatures above 79 degrees F. The efficacy of mineral
ual to that of any detergents and detergent-oil mixtures and it is usable at all tem-
.

ral oil (light) appears to be the best all-around agent for practical removal of fuel oil
ct skin, wounds, and burns. Certain detergents when mixed with mineral oil appear to en-
ability to remove last traces of fuel oil, but the increase is slight. Complete removal
il from the skin or burns has been found unnecessary.

* * * * *

WEST CHARGES UNPALATABLE

Transcontinental and Western Air Lines discovered personnel, removing carbon dioxide (sparklet) flasks from Mae Wests for the purely social purpose of making soda water. To defeat this inut shortsighted use of the inflation device, TWA first tried locking it in the vest with
e, but this was not entirely effective. Sparklet Devices, producers of the flask, was
to devise a way of making CO_2 charges unpalatable. The company responded by adding
en and peppermint, flavors undesirable in a long drink, in manufacture of sparklets. The
flask has been submitted to Wright Field for approval as standard equipment.

while, Navy Bureau of Aeronautics has issued a Technical Order (No. 44-44, 1 April 1944)
"that CO_2 bottles used on life vests will not accidentally be discharged." It is
that:

> "The actuating lever on each CO_2 bottle shall be safety-tied with one loop of breakable thread of not more than 5 or 6 pounds strength. The linen thread, 5 or 6 lb. test, used in safe-tying parachute rip cord pins is suitable."

* * * * *

TRAINING FILMS AND STRIPS

GROUP REVIEWS AND EVALUATES EXISTING FILM

The Emergency Rescue Equipment and Survival Film Group appointe evaluate existing training films and film strips to date has li five films and five strips as satisfactory for continued use. group's objective is to eliminate training films and film strip emergency equipment and survival prob'ems which deal with obsolete equipment and technical sound procedures and techniques. It also determines need for training aids on survival s and emergency equipment not already treated.

Films and strips listed as satisfactory for continued use follow:

Training Films

MN-1145 - Abandon Ship
MN-1329 - Forced Down at Sea
MN-922z - Troop Life Aboard Ship
MN-2306 - Castaway
MG-2063 - Swimming Through Burning Oil and Through Surf

Film Strips

SN-1538l - Survival in South Pacific
SN-1538a - Melanesia
SN-1538d - Marshall, Gilbert, and Ellice Islands
SN-1538f - Caroline, Marianas, and Bonin Islands
SN-1538m - Netherlands East Indies - Lesser Sunda Islands

The Review Group is composed of technicians on emergency equipment and survival techn who meet regularly in the Bureau of Ships Conference Room. Organizations represented are: gency Rescue Branch, AAF; Water Division, AGF; Bureau of Aeronautics, Bureau of Ships, an of Medicine, U. S. Navy; Training Division and Medical Division, U. S. Coast Guard, Air S Agency, and War Shipping Administration.

* * * * *

DITCHING - BEFORE AND AFTER - A NEW FILM IS REVIEWED

An Air Transport Command training film, made by Loucks & Norli Studios, New York, and produced by U. S. Rubber Company and E Air Lines. Prints are available upon official request; Navy MC-3750, Air Force number AF-112. The film maintains thought nuity, but for training purposes it may be divided into four sections: emergency equipme ditching preparation, land plane ditching techniques, and survival on a rubber raft.

The following outline is for instructors unable to procure the film immediately, and as a teaching aid when film is shown.

Emergency Equipment

1. All ATC planes flown over water carry some type of rubber raft. The C-46 Command used in film) carries *A-3 raft* described below:

   a. Raft is lashed near escape exit with 20-foot line, long enough to reach the water. It should be tied so that, when tossed from plane, carbon dioxide cylinder will be released for automatic raft inflation.

   b. Central container within raft holds the following emergency equipment: 3 collapsible oars (film shows how to remove and assemble), hand pump, sea anchor, matches in waterproof container, compass, waterproof light to float alongside raft, metal signaling mirror, 3 cans of sea marker, Very pistol and 5 flares, 9 Army "K" rations units, 7 12-ounce cans of drinking water, first-aid kit, fishing kit, 3 paulins - one for rain water, one for sail, and one for sunshade or camouflage.

ED

c. Equipment in raft side pockets includes bailing bucket, repair kit (film demonstrates methods), 40 feet of cord, whistle, oar locks, and knife.

The film illustrates and explains the use of contents in Type E-5 and E-2 Emergency e Kits, developed to be dropped by parachute to both land and sea survivors. Type E-5 terproof Overwater Emergency Sustenance Kit designed to float until picked up. Type E-2 Kit contains equipment to assist in living off the land in remote areas. Another drop- contains an *emergency radio* which automatically will transmit the International Distress The film illustrates purposes of the hand crank, light, antenna, kite, hydrogen balloon, uctions.

All personnel flying over water are supplied with *inflatable life vests*, and should be d in their operation and use as described by the film.

on for Ditching

edures for ditching vary with the type of aircraft. The method shown in the film is that C-46. Duties of crew members are:

Pilot gives short rings to indicate plane is to be ditched, instructs navigator to deter- e's position, removes parachute and dons life vest, secures shoulder harness and safety takes over flying controls. *Co-pilot* remains seated to assist until after ditching.

Navigator relays ship's position to radio operator, removes parachute and puts on life *(Important:* When wearing life vest always loosen collar and tie.) He collects maps, nd extra equipment, such as Very pistol, extra rations, water, and first-aid kit, and m in an empty parachute bag which then is secured near life rafts. Next he destroys d material, and locks chair in stationary position. Before assuming position against step ar of the cabin, he inspects flotation equipment to see that it is ready for launching.

Flight engineer assists passengers to ditching stations, instructs them in duties and hen plane hits water, opens emergency doors opposite troop door and over wing amidships, t escape lines and assumes ditching station next to navigator.

Radio operator starts sending SOS as soon as position is received, sheds parachute, dons , locks sending key, locks chair as far aft as possible, and takes ditching position in 's chair.

Pilot warns crew with one short ring as plane is about to hit the sea.

of Ditching a Land Plane

The most important factors to pilot are direction of wind and condition of sea's surface. to ditch should be made while plane still has fuel. Pilot should fly at about 100 feet te wind direction and condition of sea. When sea is glassy it is difficult to determine ction even at low altitude. Dropping smoke bomb or empty box may be helpful. When sea it is best to ditch at lowest possible airspeed.

Film shows aerial views and animated shots of sea to demonstrate the method of estimating of the wind by characteristics of ocean's surface: Wind traveling 10-20 mph, a few white 30 mph, many white caps; and 30-40 mph, spray blowing from crest of waves.

Other characteristics of the sea which indicate wind direction are: *Wind lanes*, usually indication of wind direction, are caused by gusts of wind and make ripples across ocean's *Waves*, on open sea, move with the wind and break downwind. *Foam* from breaking waves o move back from the wave and into wind. *Spray* indicates direction and strength of wind *lls* are caused by past or distant storms.

Principles for ditching are dependent upon following conditions: (Illustrated by animated

a. Wind less than 10 mph and sea calm to moderate, land plane parallel to swells and in bottom of trough.

b. Wind over 10 mph and sea moderate to rough with long swells, land into wind.

c. Sea a series of short swells, land into wind.

d. Wind at angle to sea. Judgment and experience is deciding factor. If wind is land into wind.

5. When ditching, gear should be retracted, flaps lowered to medium, and plane put d 3-point landing position. Motor is stalled just as plane touches water. There are two im first slight when tail hits, and second more severe when nose dives forward.

Life Aboard a Rubber Raft

The following hints for use of emergency equipment and advice to sea survivors are sh discussed:

1. Secure separate rafts together and travel in party.

2. The first duty is to treat the wounded.

3. Inflate cross-seats with pump. Inspect raft for leaks, etc. When inflated prope should have smooth round contour. If warm weather causes air in raft to expand, pressure released by loosening topping-off valves.

4. Take stock of provisions. Start strict rationing immediately.

5. Equipment should be lashed, even that in side pockets.

6. The raft top side is bright yellow for visibility to searching planes and ships. side is blue to appear like sky or water to fish and sharks.

7. When wind drift is considerable, cast out sea anchor to prevent excessive drift a and twisting in rough sea. Several rafts lashed together provide greater stability.

8. Take bearing and plot course regardless of distance from land and crudeness of yo gation means. Have an objective and be determined to reach it. Rig a sail with one pauli oars. Steer with third oar.

9. Water is more important than food. Catch all possible rain water. Fill every av and improvised container and then drink as much as you comfortably can. Paulin is used fo ing water and should be kept free from salt and dry to prevent mildew. *Never drink seawat* drinking water, rinse your mouth, gargle, then swallow. Sucking a button or small hard ob relieve thirst.

10. Use bailing bucket and sponge to remove water that may have been shipped.

11. Use one paulin as shade against sun. Attach it to one side of raft and pull over vors. Don't fasten at other end because raft may capsize. Oily part of fish, just under layer of skin, may be helpful in relieving sunburn.

12. The film shows the catching of fish to supplement diet, and demonstrates well-kno ing hints.

13. *Emergency radio.* Start sending signals immediately. The film demonstrates how t and operate the "Gibson Girl." The kite should be used if wind is over 7 mph. If wind is n enough, use balloon, but there is only one charge of hydrogen. The film shows a hydrogen in operation. Hydrogen gas is explosive. Radio transmits SOS automatically as long as it A light may be used for illumination or sending blinker signals by manual keying at night.

14. *Sea marker* - This is a powdered fluorescent material poured over water when sear parties are in vicinity. It makes the sea bright green. It is useful only in daylight.

15. *Very pistol and cartridges.* The number of cartridges is limited. Use only when they will be seen. Shoot them when rescue plane is sighted.

* * * * * *

)

GENCY CARE OF CREW CASUALTIES NSTRATES KIT USE

This film (TF-3335 or MA-3432) demonstrates the use of *First Aid Kit, Aeronautics* issued for each two men aboard an AAF plane. The film includes instructions for using each item and the first-aid treatment for pain and shock, bleeding, wounds and cuts, burns

ures.

he first part of the film the flight surgeon lectures and demonstrates when and how to ine syrettes, iodine, sulfa powder and tablets, gauze compresses and bandages, boric acid eye dressings, splints, tourniquet, and Halazone tablets.

second part of the film is a simulated scene of casualties on a bomber after enemy engage- ew members illustrate what has been learned by recognizing injuries and treating them un- l conditions inside a plane.

* * * * * *

SIGNALS RESCUE

Pyrotechnic flares signaled a Dutch PT Boat to the rescue of a B-18-C pilot and crew forced down while on sub patrol near Curacao. The right engine had quit. A power landing with the remaining engine was made titude of twenty-five feet. Landing was tail down and across a swell. The sea was nd temperature was about 28 degrees C. The plane stayed afloat three days. A five-man e-man raft were used. Rations consisted of one quart of water, and parachute rations stale and dehydrated. The parachute was used for protection against weather. Rescue fter three days.

* * * * * *

BOOK REVIEWS

ARCTIC MANUAL - TM 1-240, DEPARTMENT REVISION AS JANUARY 1944-ORDERED

A new edition of the Arctic Manual is designed primarily to acquaint men with the environment in which they are living when they are stationed on more remote posts and camps in arctic and sub-arctic areas. It contains valuable hints off the land in emergencies.

One of the manual discusses "Character of the Arctic Country." It covers basic geo- atures, including information about tides, currents. weather, topography, inhabitants, animal life.

Two concerns procedures and techniques designed for living in frigid zones. This Army manual treats special problems of providing heat and shelter, obtaining and preparing water, caring for clothing and equipment, traveling preventing and treating arctic ail- l making the best of forced landings.

-240 is widely distributed to Army personnel. It is used as a training manual in teach- Troops, Mountain Troops, Arctic Search and Rescue Squadrons, and Weather Units serving n climes. The U. S. Marine Corps has requested 1,500 copies and 1,000 copies were or- J. S. Navy.

* * * * * *

PE FOR SURVIVAL F. COMDR. WILLIAM C FLISS, IS PUBLISHED

"Recipe for Survival" first appeared in *U. S. Naval Institute Proceedings* for July, 1943. In recognition of the clear and comprehensive value of this article as instruction in abandon-ship technique, it was reprinted in pamphlet form st for wide distribution among Navy personnel. It has now been made available to a large publication in the March 25, 1944, issue of *Colliers Magazine.*

* * * * * *

PUBLICATIONS RECEIVED
(February 15 to April 15, 1944)

CLOTHING, PROTECTIVE

Griffin, D. R., G. E. Folk, and H. S. Belding.

Physiological Studies of Exposure Suits in Hot and Cold Environments. Comittee cal Research of the Office of Scientific Research and Development. Report No. 20 frc Harvard Fatigue Laboratory. 9 March 1944.

Joint United States-Canadian Air-Sea Rescue Trials, Washington-Ottawa.

Tactical Test Report, Exposure Suit - Aviation. 21 November 1943

EMERGENCY EQUIPMENT

Canada, Dept. of Transport.

Regulations Respecting Fire Extinguishing Equipment. Approved ... 2 February 19

Regulations Respecting Life Saving Appliances. Approved ... 6 January 1937.

Safety Fuel Incorporated, West Cheshire, Conn.

Emergency Portable Still for Abandon Ship Boats and Rubber Rafts for Converting Water into Fresh Water.

U. S. Coast Guard.

Specifications for Lifesaving Suits ... 1 January 1944.

FOOD

Dahlgren, B. E., and Paul C. Standley.

Edible and Poisonous Plants of the Caribbean Region ... Issued by the Bureau of and Surgery, Navy Dept. 1944.

Hanson, Earl Parker.

Study of Report on Pemmican as an Emergency Ration.

HEALTH AND MEDICAL INFORMATION

Joint Intelligence Collection Agency, China, Burma, India,

India - Malarial Parasites: An Economic and Simple Method of Staining Thick Blo for the Detection of Malaria Parasites. (Restricted)

Starling, Ernest Henry.

Starling's Principles of Human Physiology. 8th ed. 1941.

LIFEBOATS AND LIFE RAFTS

Gt. Brit. Air Ministry.

The Airborne Lifeboat Mks I and IA. Instructions for a Ditched Crew ... (Restri

The Type "Q" Dinghy. Instructions for a Ditched Crew ... (Restricted)

Gt. Brit. Director of Aircraft Safety.

A Description of the Airborne Lifeboat and Its Operation by a Crew ... (Restrict

Gt. Brit. Ministry of Aircraft Production.

Description of Proposed Airborne Lifeboat, Mk II. (Restricted)

Spitfire Dinghy Rescue Apparatus Description (Restricted)

Pingree, Frederick De W.

Memorandum on Wind Drift Tests for Rubber Life Rafts ...

Taylor, E. D.

Taylor Life Raft, Improved and Nonsinkable Type.

LOCALE INFORMATION

sert and Tropic Information Center.
Care of Personnel in the Arctic. Informational Bulletin, no. 8. 1 February 1944.
Care of Personnel in the Desert. Informational Bulletin, no. 7. 25 January 1944.
Care of Personnel in the Wet Tropics. Informational Bulletin, no. 9. 26 January 1944.
Living off the Southwest Pacific Tropics. Informational Bulletin, no. 5.
nuary 1944.

ernt, and Corey Ford.
War Below Zero. From: Colliers, 19 February 1944.

DEPT.
Arctic Manual, 17 January 1944. *Its* Technical Manual TM 1-240.

Dept. Military Intelligence Division.
Customs of the Mongolian People ... (Restricted)

NAVIGATION

old.
The Raft Book; Lore of the Sea and Sky ... "Second edition," October 1943.

OCEAN SURVIVAL

ard.
Her Form Was Fair ... From: Saturday Evening Post, 8 Jan. 1944. pp. 22-23.

ward G.
Housekeeping for Castaways ... From: Facts, 1 March 1944. pp. 95-98.

TRAINING

Dept.
List of Publications for Training ... 1 February 1944. *Its* Basic Field Manual, FM 21-6.
List of Training Films, Film Strips and Film Bulletins ...1 January 1944. *Its* Basic Manual, FM 21-7.

* * * * * * * * *

AF SURVIVAL L NOW IS UNDER RATION BY ADTIC

SURVIVAL, a manual containing general and pertinent information on the techniques of survival at sea and methods of living in the jungle, desert, and arctic areas of the world, is now under preparation by the Arctic, Desert, Tropic Information Center y Air Forces. This publication is a condensation of JUNGLE, DESERT, ARCTIC, OCEAN EMER- sued by the Office of Flying Safety, AAF. Printed on waterproof paper and approximately ide and 7 inches long, the booklet is designed to be carried conveniently in life-vest towed in droppable kits and all types of rubber rafts. It is anticipated that the manual ailable for distribution in several months. In addition, ADTIC is preparing more de- klets for specific geographic and climatic regions of the world that will be placed in oms and reference libraries of the theaters which they treat.

* * * * * * * * *

EXHIBIT EQUIPMENT

TYPE B-4 PARACHUTE EMERGENCY KIT DESCRIBED, SPECIFICATION NO. 40463 DRAWING NO. 43J100434

The B-4 Kit is a seat or back-pad type, assembled to each flyer with equipment and supplies for emergency event of forced landings or abandonment of aircraft i desert, jungle, water, or rugged areas.

This B-4 Kit was designed to replace the present type B-1 Alaskan and Type B-2 Jungle Back-Pad when the present supply of Type B-1 and Type B-2 Kits is exhausted.

The container is of olive drab canvas. It opens on three sides with a metal zipper. about 15 x 13 x 2 inches and weighs approximately 12 pounds complete.

Inside the top is an unattached cushion in a waterproof case. When the cover is ripp the upper end, it is found that the kit padding actually is a short quilted poncho. It is with feathers and measures 66 x 40 inches when unfolded. This may be used as protection a cold, or as a signal panel in case of necessity.

A webbing strap on the waterproof case permits the container to be worn as a knapsack.

The lower half of the B-4 is lined with felt and has molded sections designed to hold the following equipment:

1 compass, packet type, in a hunting case.
1 container assembly for water made of translucent vinylite.
1 transparent waterproof match container filled with matches dipped in paraffin.
2 flares, parachute emergency kit signal, "5 minute Red Fusee."
1 pair of gloves, mechanic's, Type D-2.
1 pair of goggles, with green lenses, in leather case.
1 headnet, mosquito.
1 emergency fishing kit contained in a wax-sealed package, 4 x 1½ x 9 inches.
1 pan assembly, emergency kit, cooking, consisting of a separate frying pan, hand and lid.
1 parachute ration contained in a tin box, 6-5/8 x 1½ x 4-1/8 inches and includi package of cheese, 1 package of biscuits, 2 2-oz. chocolate bars, 1 1-oz. frui 7 cubes of sugar, 1 package of coffee, 1 package of lemonade powder, 3 package chewing gum, and 1 tube of water purifying tablets..
1 parachute emergency kit fire starter in a can, 2 inches in diameter.
1 pocket knife with three blades.
1 machete with folding handle and 10 inch blade, in a metal sheath.
1 parachute first-aid kit in a transparent plastic case which fits into the fryi This includes boric acid ointment, 6 tablets of benzedrine sulfate, 8 salt tab 12 atabrine 0.1 gram, iodine, 30 halazone tablets, 8 tablets-0.5 grams, 7.7 gr each of sulfadiazine, 5 grams of crystalline sulfanilamide, compressed tea, ne cotton thread (for clothing repair), 6 1-inch adhesive absorbent compresses, 2 tabloid bandage compresses, a package of soap.
1 glass signaling mirror with lanyard, ESM/1.

The Army Air Forces Technical Order No. 00-30-145, February 17, 1943, in describing t kit indicated that it should be supplemented by the first-aid packet (Medical Department, 97785) worn on parachute harness. To the list above this adds a Carlisle first-aid dressi syrette of solution of morphine tartrate, and one tourniquet.

* * * * * * * *

BRITISH APPROVAL OF G.D.P. LIFEJACKET LIGHT WITHDRAWN

The Air Sea Rescue Agency has been advised that the Ministry of War Transport has withdrawn its approval G.D.P. type of lifejacket light made by Halex Ltd. in Bi-Weekly Report #6, Emergency Rescue Equipment, November 10, 1943, carried a list of f of lifejacket lights, including the G.D.P. type, reported at that time to have been approve Ministry of War Transport. Latest reports, however, advise that subsequently the G.D.P. t light was found unsatisfactory.

The last issue of the Bi-Weekly Report had been published before this information was by The Air Sea Rescue Agency, successor to the unit which formerly published the Report.

* * * * * * * *

ADDITIONAL TYPES OF EQUIPMENT RECEIVED
(January 30 to April 1, 1944)

Catalogue No.	Object	Source
44.58.1	Air compressor, diaphragm, experimental model.	The Cornelius Co. Minneapolis, Minnesota.
44.61.1.1-2	Kit, fastener, NAF 1156-1 Spec. K-2.	United Carr Fastener Corp., Cambridge, Mass.
44.62.1-12	Signals, USN, drift, night, AN Mk.5, Mod. 1 (12) RESTRICTED	NAD, St. Juliens Creek, Portsmouth, Virginia.
44.64.1.1-38	Still, portable, Series C, Model 10G (10 gallon cap.)	Higgins Ind., Inc. New Orleans, La.
44.64.2.1-27	Still, portable, Series C, Model 2½G (2½Gal. cap.)	Higgins Ind., Inc. New Orleans, La.
44.67.1-2	Fabric, aluminum coated, "Insulation Facing #1" (2 samples)	E.I. Dupont de Nemours & Co., Inc. New York, N. Y.
44.72.1	Transmitter, rescue, sample	Signal-U Mfg. Co. Youngstown, Ohio
44.73.1.1	Cushion, rubber sponge, for use with parachute pack British	U.K.. (through British Air Com. Washington, D.C.)
44.73.1.2	Compass, marching, magnetic British, Mk. 1	U.K. (through British Air Com. Washington, D.C.)
44.73.1.5-8	Sea Markers, fluorescein, British (4)	U.K. (through British Air Com. Washington, D.C.)
44.73.1.9	Pistol, 1", for use with 1" red Mk. XII. T signal cartridges, British	U.K. (through British Air Com. Washington, D.C.)
44.73.1.10-20	Signals, distress, 2 star red, Mk. 11, British (11)	U.K. (through British Air Com. Washington, D.C.)
44.74.1.1-2	Compass, wrist, liquid, Swedish, Silva, Type 10	OSRD Research and Development (through Mr. Waldemar Dietz)
44.74.2-4	Compass, Swedish, Silva, Type 15	OSRD Research and Development (through Mr. Waldemar Dietz)
44.76.1-3.1-5	Kits, "Scotchlite," reflective sections cut to fit life raft oars (3)	Minnesota Mining & Mfg. Co., St. Paul, Minnesota
44.77.1-2	Preservers, life, expendable, oral-inflating, experimental (2)	OQMG Military Planning Div. (Dr. E. L. Gustus)

Catalogue No.	Object	Source
44.79.1..-2	Skiis, Army (1 pair)	Allied Aviation Corp., Baltimore, Maryland
44.80.1	Float, life, Carley, Canadian, 10-man	Naval Storekeeper Montreal, Quebec, Canada
44.82.1-17	Preservers, life, captured enemy (German, Italian, French, Japanese) (17)	Navy Dept., Office of Chief of Naval Operations, Washington, D. C.
44.84.1.1-16	Container, aerial delivery type A-10'	Western Plastics, Inc., Glendale, California
44.85.1.1-5	Respirator, Swan's, "rubber lung"	E.D. Bullard Co. Washington, D.C.
44.86.1.1-6	Heater, lifeboat and raft, emergency, R.C.N.	Canadian Joint Staff, Washington, D.C. (Naval Member)
44.89.1.1-2 44.89.2-6.1	Signals, smoke, Canadian, orange small, 15D/116 (6) (samples, hand made)	Canadian Joint Staff, Washington, D.C. (Air Member thru Sq. Ldr. Smith)
44.91.1-5	Containers, waterproof, empty (5)	U.S. Rubber Company, New York, New York
44.91.6-8	Bags, boiling, collapsible (3)	U.S. Rubber Company New York, New York
44.94.1-3	Chart "handkerchief," waterproof, NACI-HO RESTRICTED	USN, BuAer, Air Combat Intelligence
44.97.1	Lamp Assembly, identification for aerial delivery container	CSD, FASC, Patterson Field, Fairfield, Ohio
44.97.2	Parachute "canopy," cargo aerial delivery, red	C, SD, FASC, Patterson Field, Fairfield, Ohio
44.97.3	Parachute assembly, cargo type G-2, white parachute	C, SD, FASC, Patterson Field, Fairfield, Ohio
44.97.4.1-2	Container, Assembly, cover and body, for use with cargo parachute 44.97.2	C, SD, FASC, Patterson Field, Fairfield, Ohio
44.97.5.1-14	Container, aerial delivery type A-5	C, SD, FASC, Patterson Field, Fairfield, Ohio
44.102.1	Kit "DS," desalination 2 quart ration	Dr. Alexander Goetz of California
44.103.1-6	"Shark chasers" (6)	Naval Research Laboratory (thru Mr. S. Springer)

Catalogue No.	Object	Source
44.104.1.1-2	Knife, trench, M-3, and scabbard M-8	Ord. Prop. Officer Ft. Myer, Virginia
44.111.1	Mask, gas, protecting re-breathing mechanism, with quick release disconnect	Mine Safety Appli-ance Co., Pitts-burg, Penna.
44.115.1-3	Raft, life, Weber, 20-man (section)	Weber Showcase & Fixture Co., Inc., Los Angeles, Calif. (thru Coast Guard)
44.116.1-3	Vests, life preserver, pneu-matic, Types F-6, F-10 and F-12 (experimental)	Firestone Tire & Rubber Co., Wash. D. C.
44.120.1	Hat, sun protective, for use in life rafts (aluminized fabric)	Thermo Electric Prod-ucts, Inc., Nash-ville, Tennessee
44.123.1-4	Compresses, emergency, Calhoun	Surgical Devices Co. Bronx, New York

* * * * *